

## Big Horn County USDA-NRCS

### Long Range Plan

**Updated 8/11/2021**

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## **Section I. Introduction –**

**Vision:** Commitment to local action, achieving effective land stewardship.

**Mission:** Successfully collaborate on watershed or landscape-wide conservation projects in order to address resource concerns in Big Horn County.

**Plan Purpose:** To provide an overview of the condition of natural resources, provide a social profile, and highlight the resource concerns for each land use in Big Horn County. This includes the majority of the Crow Indian Reservation, and a portion of the Northern Cheyenne Indian Reservation.

### **Entities Who Have Participated in the Development of this Plan:**

- USDA-Natural Resources Conservation Service
- Big Horn Conservation District
- Crow Tribe of Indians
- Montana State University, Big Horn County Extension
- Montana Fish, Wildlife, and Parks

**Estimated Timeframe Covered by this Plan:** Fiscal Years 2021 through 2026.

## **Section II. Natural Resource Inventory:**

### **Humans:**

#### **Land Cover:**

<b>Land Use</b>	<b>Acres</b>	<b>% of Total Acres</b>
Cropland (Irrigated and Dryland Combined)	340,837.00	10.6%
Forest	430,506.78	13.4%
Pasture/Hay	72,450.13	2.3%
Rangeland (Riparian and Wetland Areas Included)	2,306,009.10	71.9%
Open Water	10,721.00	0.3%
Developed Land (Roads, Railroad, Residential, etc.)	34,348.41	1.1%
Mining and Resource Extraction	14,027.08	0.4%
<b>Total Acres</b>	<b>3,208,899.50</b>	<b>100%</b>

**Figure 1.0**

### **Ownership:**

Land ownership acres on the Crow and Northern Cheyenne Indian Reservations are approximate. Periodically, Land-Buy-Back programs are offered through the tribes in order for the respective Tribes to purchase back land, especially land with highly fractionated interests. These acreage amounts were pulled from GIS shapefiles and Bureau of Indian Affairs.

<b>Big Horn Ownership Parcels (Amounts are Approximate)</b>		<b>Percent of Big Horn County Total Acres</b>
<b>Big Horn County Total Acres</b>	<b>3,208,899.5</b>	<b>100%</b>
<b>Total Federal Land</b>	<b>18,642.96</b>	<b>0.58%</b>
BLM	16,041.23	
DOI BOR	263.04	
NPS	2,338.69	
<b>Total State Land</b>	<b>106,815.56</b>	<b>3.32%</b>
DNRC State Land	103,099.43	
MT Fish, Wildlife, and Parks	3,716.13	
<b>Approximate Private Land</b>	<b>1,475,317.62</b>	<b>45.98%</b>
<b>Crow Reservation Total Acres</b>	<b>2,304,560.00</b>	
<b>Big Horn County Crow Reservation Total Acres</b>	<b>2,073,687.00</b>	<b>64.6%</b>
Allotted	904,346.49	
Special Allotted	3,558.02	
Tribal	503,634.50	
Tribal Reserve	239.44	
Tribal Special Allotted	361.02	
US DOI	1,409.19	
Fee Land	660,138.34	
<b>Northern Cheyenne Reservation Total Acres</b>	<b>445,475.00</b>	
<b>Big Horn Northern Cheyenne Reservation Total Acres</b>	<b>183,733.00</b>	<b>5.7%</b>
Tribal	148,609.00	
Allotted	35,124.00	

*Figure 1.1*

Number, Types and Size of Farms:

<b>Montana Ag Statistics for Big Horn County, 2018</b>				
	<b>Big Horn 2007</b>	<b>Big Horn 2012</b>	<b>Montana Total 2007</b>	<b>Montana Total 2012</b>

<b>Number of Farms</b>	695	527	29,524	28,008
<b>Land in Farms</b>	2,899,620 ac	3,148,871 ac	61,388,462 ac	59,758,917 ac
<b>Average Size of Farms</b>	5514 ac	5437 ac	2079 ac	2134 ac

**Figure 1.2**

## County Demographics Description

### Big Horn County, Montana Demographics Description

Over 12,000 people live in Big Horn County, Montana. The county consists of approximately 3.2 million acres. The population density is about 2 people per square mile. The racial makeup of the county approximately 36.6% White, 0.04% African American, 59.66% Native American, 0.22% Asian, 0.68% from other races, and 2.79% from two or more races (based off of 2000 census data). The median income for a household in this county is \$27,684, and the median income for a family was \$31,095. About 29.2% of the population is below the poverty line. Coal mining, and agriculture are both main contributors to the County's economy, and recreation (especially fishing along the Big Horn River) has also been a consistent economic source in the county. The first thirteen miles of the Big Horn River from Yellowtail Dam by Fort Smith, MT is considered "Blue Ribbon" fishing habitat for brown and rainbow trout.

According to the 2012 National Ag Statistics Service (NASS) data (Figure 1.2), the number of Farms in Big Horn County was 527 (a decrease from 695 in 2007). The number of male principal operators was 430, and the number of female principal operators was 97.

In 2017, there was approximately 8000 acres of Sugar Beets harvested in this county, and Barley acreage was about 12,800 acres. Farms and ranches in the county produce mainly beef cattle, sugar beets, alfalfa, and small grains. A common cropping rotation on irrigated cropland in Big Horn County has been malt barley, winter wheat (or spring wheat), and sugar beets, with some alfalfa and/or corn. Residue management on irrigated cropland is often considered "conventional," (average RUSLE2 STIR value: 84.1), although there have been one or two progressive farmers who have experimented with No-Till/Minimum-Till Sugar Beets (WEPS STIR Value: 35.1), in addition to other Soil Health practices, and have had positive results from this.

On the ranching end according to NASS data, Big Horn County has had 76,000 and 73,000, head of all cattle calved in 2017 and 2018, respectively. There was 49,000 and 49,500 head of beef cows and heifers that calved in 2017 and 2018, respectively, as well. There were no pigs or milk cows reported in the 2018 NASS report for Big Horn County, as the data reported showed too small of numbers to be statistically relevant. As for sheep, there were 600 and 500 head raised in 2017 and 2018, respectively. Historically, sheep played a significant role in grazing on the rangeland from the late 1800's to 1930 but have since steadily declined as beef cattle took over the role of being the predominant grazing livestock on the range.

### Any Specialty Production/Operations:

Sugar Beets and Malt Barley crops are grown on the Big Horn and Little Big Horn River irrigated valleys. Sugar Beets are marketed through Western Sugar Cooperative, which is a farmer-owned cooperative. Local “beet dumps” are located in several locations along the Big Horn River valley, and the closest processing facility is located in Billings, MT. While some malt barley may be sold on the open market and some through Busch Ag, the majority of malt barley grown in Big Horn County is marketed through MillerCoors, with the closest receiving facility located in Huntley, MT.

**Soil:**

Major Land Resource Areas (MLRA's):

MLRA's in Big Horn County include:

- 58A, Northern Rolling Plains, Northern Part
  - This MLRA makes up the majority of Big Horn County. Climactic information for this MLRA includes:
    - The majority of the rangeland in these areas falls within the 11 to 13 inch range. During an average year, 70 to 75 percent of the annual precipitation falls between April and September, which are the primary growing season months. Snowfall is not heavy in the area, averaging 28 total inches in the 10 to 14 inch MAP (Yellowstone Valley). Heavy snowfall occurs infrequently, usually late in the winter or early spring. Snow cover is typically 1 to 3 inches.
- 58B, Northern Rolling Plains, Southern Part
  - Primarily located in the southeast area of Big Horn County.
- 46, Northern Rocky Mountain Foothills
  - Located in the south-central and southwest areas of Big Horn County, along the foothills of the Big Horn and Pryor Mountains.
- 43B, Central Rocky Mountains
  - Located on the lefthand side of the south-central portion of Big Horn County in the Big Horn Mountains.

Soils Overview

Big Horn County is dominated by gently sloping to very steep, shallow to very deep, well drained, sandy, loamy, and clayey textured soils. These soils were formed in a semi-consolidated sedimentary beds, baked sandstone, loamy textured, and formed in colluvium or residuum derived mainly from limestone or dolomite on hillslopes in mountains.

The majority of the county's natural historic plant communities are dominated by western and thickspike wheatgrass, bluebunch wheatgrass, green needlegrass, little bluestem, big sagebrush, and various forbs. Average potential production of these areas range from 1100 to 1500 pounds per acre. Historic plant communities in the Rocky Mountain Foothills MLRA region consist of green needlegrass, Idaho fescue, bluebunch wheatgrass, snowberry, rose, and several forbs. Average potential production of these areas range from 1500 to 2000 pounds per acre. Historic plant communities from in bottomland, subirrigated sites include: western wheatgrass, sedges, reedgrasses, prairie cordgrass, willow, rose, chokecherry, and buffaloberry. Average potential production ranges from 2000 to 5000 pounds per acre.

Prime Ag Soils, HEL Soils, Hydric Soils, etc.-

<b>15 Most Common Soils in Big Horn County</b>			
<b>Map Unit Symbol</b>	<b>Map Unit Name</b>	<b>Map Unit Acres</b>	<b>Map Unit Extent</b>
DT	Duncom-Tarrete association, hilly	145,601	4.8
LCd	Lap-Armington association, rolling	74,738	2.5
DOe	Doney-Wayden complex, hilly	67,947	2.3
MVf	Midway-Thedalund complex, hilly	62,783	2.1
PN	Pierre-Lismas clays, hilly	50,948	1.7
DS	Duncom-Tarrete association, rolling	49,854	1.7
HB	Hanson-Babb association, very steep	47,767	1.6
DOb	Doney-Ringling complex, hilly	46,883	1.6
NH	Norbert-Eltsac clays, hilly	39,046	1.3
LM	Lismas-Shale outcrop complex, steep	38,663	1.3
Dn	Doney-Reeder loams, rolling	38,441	1.3
MVb	Midway silty clay loam, hilly	36,374	1.2
THn	Thedalund-Wibaux stony loams, hilly	34,506	1.1
AB	Abac loam, hilly	33,374	1.1
LH	Lismas gravelly clay, hilly	33,249	1.1

**Figure 2.0**

Sofia silty clay loam soils are the only soils in the Big Horn County Soil Survey Area that is listed as Prime Farmland, totaling about 8651 acres. There are approximately 222,124 acres of soils listed as Farmland of Statewide Importance, and approximately 201,474 acres are designated as Prime Farmland if Irrigated. About 139,952 acres are designated as Hydric Soils. Hydric Soil designations are one of the three essential characteristics used when determining the presence of a wetland (hydric soils, hydrophytic vegetation, and wetland hydrology).

**Water:**Climate:

According to the Big Horn County Soil Survey, elevation within the assessment area ranges from as high as 9200 feet above sea level on some mountain peaks in the southern part to about 2700 feet where the Big Horn River leaves the area north of Hardin. The area as a whole has a modified continental climate; but within that general climate type, mountain effects on temperature and precipitation patterns have a wide range. Winter snowfall in the high mountains along the Wyoming border is much greater than in most other parts of the area, reaching a depth of 100 inches or more.

The longest growing season in the area is around Hardin, where the 32-degree freeze-free season averages 125 days. This compares to 70 days at higher elevations.

The area is subject to air masses from several sources. During winter, the coldest weather comes from a few Arctic air invasions followed a few days later by warmer air from the Pacific. Spring and early summer are the wettest parts of year. Significant spring precipitation events are common, due to passing low-pressure systems, which can tap into moisture from as far away as the Gulf of Mexico, from March through June. Midsummer afternoon thunderstorms occur about 25 to 35 days a year, sometimes accompanied by hail and gusty winds.

Two-thirds to three-fourths of the yearly average precipitation falls between April 1 and September 30. Average yearly precipitation ranges from approximately 10 to 14 inches in the lower elevations to 15 to 19 inches in the higher elevations. There are extremes on both sides. The lowlands of the Pryor Mountains receive 5 inches per year versus some foothill areas receiving 25 inches per year.

Large annual temperature variations occur in the area. The minimum and maximum temperatures range from below -30 degrees Fahrenheit (F) to above 100 degrees F respectively.

#### Watersheds and Streams

- Big Horn River – The largest river in Big Horn County. The Big Horn River begins at Yellowtail Dam, which is located at the mouth of the Big Horn Canyon by Fort Smith, Montana, and continues north/northeast into Treasure County before joining with the Yellowstone River. Yellowtail dam was constructed in 1967, creating the Big Horn Canyon National Recreation Area, mitigating much of the seasonal flood risk in the Big Horn River Valley downstream, providing irrigation water, and also generating power. The first thirteen miles of the Big Horn River are considered high quality trout fishing habitat and is a favorite fishing area for recreationists. Stream flows along the gauge stations for this river include:
  - Near St. Xavier, MT: Monthly mean values from Oct.-Feb. range from 2770 cubic feet per second (cfs) to 3140 cfs; from Mar. to Jul. range from 3140 to 7600 cfs; Aug. -Sept. ranges from 2380 to 2950 cfs.
  - Tullock Creek Near Bighorn, MT: Mean values from Oct.-Feb. range from 3100 cubic feet per second (cfs) to 3230 cfs; from Mar. to Jul. range from 3690 to 6310 cfs; Aug. - Sept. ranges from 2840 to 3020 cfs.
- Little Big Horn River –The second-largest river in Big Horn County. This river originates from the Big Horn Mountains, and travels north/northwest until it joins with the Big Horn River outside of Hardin, MT. The Little Big Horn River is undammed, and periodically experiences considerable seasonal flooding, especially in the spring. Stream flows along the gauge stations for this river include:
  - Near Hardin, MT: Monthly mean values from Oct.-Feb. range from 131 cubic feet per second (cfs) to 152 cfs; from Mar. to Jul. range from 255 to 830 cfs; Aug. -Sept. ranges from 115 to 125 cfs.
- Lodge Grass Creek – Originates from the Big Horn Mountains, and travels in a northeasterly direction until it joins the Little Big Horn River at Lodge Grass, MT.
- Fly Creek – Originating in West-Central Big Horn County, Fly Creek travels in a northerly direction, crossing into Yellowstone County and eventually emptying into the Yellowstone River.

High nitrates and total dissolved solids have been reported as a significant concern along this creek.

- Soap Creek –Originating in the Big Horn Mountains, and travels northerly until joining the Big Horn River south of Saint Xavier, MT.
- Pryor Creek – Coming from the Pryor Mountains, Pryor Creek travels north/northeast through Big Horn and Yellowstone Counties until meeting up with the Yellowstone River south of Huntley, MT.
- Tongue River – Coming from the Big Horn Mountains in Wyoming, the Tongue River travels northeasterly through Sheridan County, WY, into Big Horn County where the Tongue River Dam resides and continues northeast through Rosebud and Custer Counties until eventually emptying into the Yellowstone River.
- Tullock Creek –Originating from the Wolf Mountains, Tullock Creek travels in a north/northwesterly direction and eventually empties into the Yellowstone River.
- Sarpy Creek – Originating in the Rosebud Mountains, Sarpy Creek travels in a north/northwesterly direction into Treasure County, and eventually empties into the Yellowstone River.

#### Irrigated Lands, Water Rights, and Irrigation Districts

Most of this information has been acquired through the Water Resources Survey for Big Horn County, Montana, published by the State Engineer and State Water Conservation Board on May 1947, as well as current general knowledge of the irrigated land. This information may not include some private ditches throughout the county. In the coming years, the State Montana may be updating the Water Resources Survey, as well.

- Irrigation Units:
  - Two Leggins Canal – Operated and maintained by the Two Leggins Water Users Association. The canal diversion is located in the Big Horn River, approximately seven miles south of Hardin, MT (SE20-2S-33E). From the point of diversion, the main canal runs in a northeasterly direction nearly parallel with the Big Horn River along the foot of the hills skirting the valley on the west side of the Big Horn River, approximately 26 miles in length.
  - Low Line Ditch Canal – Operated and maintained by the Big Horn Low Line Ditch Canal Company. Point of diversion is located in 34-1N-33E in the Big Horn River. This canal travels in a northerly direction for about 14 miles.
  - Big Horn Unit – Part of the Crow Irrigation Project, and operated and maintained by the Bureau of Indian Affairs (BIA) and Crow Tribe. The diversion is located near the mouth of Big Horn Canyon (also north of the Yellowtail Dam and Afterbay) in 18-6S-31E and runs in a northeasterly manner approximately 33 miles.
  - Bozeman Trail Ditch Company – Operated and maintained by the BIA and Crow Tribe. The diversion is located in the Little Big Horn River, section 11-9S-34E, and travels in a northeasterly direction for a little under 10 miles.
  - Farmers Ditch Company – The diversion is located in the Big Horn River in section 1-2S-33E. The ditch is operated and maintained by the users of the Farmers Ditch Company.



- Forty Mile Unit – Part of the Crow Irrigation Project, the diversion is located in section 11-7S-35E and runs about 4 miles. This canal is operated and maintained by the BIA and Crow Tribe.
- Lodge Grass No 1 Unit - Part of the Crow Irrigation Project and operated and maintained by the Bureau of Indian Affairs (BIA) and Crow Tribe. Water is diverted from Lodge Grass Creek at SW29-6S-35E and the canal about 13 miles long.
- Lodge Grass No 2 Unit – Also part of the Crow Irrigation Project and operated and maintained by the Bureau of Indian Affairs (BIA) and Crow Tribe. Water is diverted from Lodge Grass Creek at SW11-7S-34E, and this canal runs about 4 ½ miles. Lodge Grass Creek has the Willow Creek Reservoir upstream, which has helped mitigate some of the available water supply later in the year, but water quantity can still be an issue at times.
- Pryor Unit – Also part of the Crow Irrigation Project, and encompasses several ditches (Pryor, Lost Creek, and Coburn Ditches).
  - Coburn Ditch- The diversion is located in Pryor Creek at SE35-1S-27E and runs about three miles long.
  - Lost Creek – The diversion for this ditch is located in Lost Creek at SE34-5S-26E, and is currently unused, although there are some potential plans for re-vamping this ditch through DOI BOR and the Crow Tribe’s Rehabilitation and Improvement of the Crow Irrigation Project, but this ditch is listed as fairly low priority.
  - Pryor Creek – The diversion is located in Pryor Creek at 31-5S-26E, and the ditch is about 6.5 miles in length. During the flood of 2011, there was significant damage to a portion of the canal, and it is unknown if this canal is fully operational at this time. This ditch is also a part of the above-mentioned rehabilitation project but is considered a low priority for rehabilitation at this time.
- Reno Unit – Part of the Crow Irrigation Project and is operated and maintained by the BIA and Crow Tribe. The diversion is in the Little Big Horn River and is located at NW16-4S-35E and runs about 9.8 miles.
- Soap Creek Unit – Also part of the Crow Irrigation Project and is operated and maintained by the BIA and Crow Tribe. The diversion is located in NE3-6S-32E in Soap Creek and runs about 7.5 miles. According to the 1947 Water Resources Survey, *“The water supply is completely inadequate to serve all of the lands under this system.”*
- Upper Little Horn No. 2 Unit - Also part of the Crow Irrigation Project and is operated and maintained by the BIA and Crow Tribe. The diversion is located in the Little Big Horn River in NW15-9S-34E and runs less than 9 miles in length. This canal is also cited as not having enough water to supply all of the users under the entire system.
- Significant Water Structures:
  - Yellowtail Dam- Located adjacent to Fort Smith, MT, Yellowtail Dam was built in the 1960’s (construction was completed in 1966), along the Big Horn River, which created the Big Horn Lake Recreation Area, and also provides consistent irrigation water as well as mitigating flooding risk in the Big Horn River Valley. Storage for the dam is estimated

at about 1,331,725 acre-feet, and its hazard potential is considered high. General management of this dam is by the Bureau of Reclamation.

- Willow Creek Dam- Located in sections 6 and 7-8S-34E and sections 1, 2, 11, and 12-8S-33E. This dam is about a ½ mile above the confluence of Willow Creek and Lodge Grass Creek, with construction being completed in 1941. This reservoir was constructed to provide supplemental water supply for all land served from the Little Big Horn River watershed. The dam is a rolled, earth fill structure, and it's hazard potential is considered high. There are some structures in and below this dam that are recommended as a medium priority for the Crow Irrigation Project Rehabilitation project. Management of the dam is through the Bureau of Indian Affairs.
- Tongue River Dam and Reservoir – Part of the Montana State Water Conservation Board Project, this dam and reservoir is located about 10 miles north of the Montana-Wyoming State Line. The dam is an earth, sand, and gravel fill structure. The flooded area of the reservoir covers about 2400 acres.

### 303(d) Listed Streams and TMDL Streams:

The Rosebud and Tongue River Watersheds are slated by the Montana Department of Environmental Quality (MT DEQ) for TMDL plan development between 2017-2022.

Below are the Montana DEQ Summary reports for water quality on the creeks and rivers in Big Horn County excluding the Crow and Northern Cheyenne Indian Reservations:

- Fly Creek:

Impairment Information			
Probable Cause	Probable Sources	Associated Uses	TMDL Completed
Alteration in stream-side or littoral vegetative covers	Agriculture, Loss of Riparian Habitat, Dam or Impoundment	Aquatic Life	N/A
Chlorophyll-a	Dam or Impoundment, Agriculture, Loss of Riparian Habitat, Drought-related Impacts	Aquatic Life, Primary Contact Recreation	N/A
Dissolved Oxygen	Loss of Riparian Habitat, Drought-related Impacts, Dam or Impoundment	Aquatic Life	No
Nitrate-Nitrite (Nitrite plus Nitrate as N)	Agriculture	Aquatic Life	No
Nitrogen, Total	Agriculture	Aquatic Life	No

**Figure 3.0**

- Big Horn River:

Impairment Information			
Probable Cause	Probable Sources	Associated Uses	TMDL Completed
Lead	Source Unknown	Drinking Water	No
Mercury	Source Unknown	Drinking Water	No

**Figure 3.1**

- Tullock Creek:

Impairment Information			
Probable Cause	Probable Sources	Associated Uses	TMDL Completed
Alteration in stream-side or littoral vegetative covers	Loss of Riparian Habitat,Rangeland Grazing,Dam or Impoundment,Natural Sources	Aquatic Life	N/A
Flow Regime Modification	Water Diversions,Dam or Impoundment,Natural Sources	Aquatic Life	N/A
Iron	Loss of Riparian Habitat,Natural Sources	Aquatic Life	No
Nitrogen, Total	Rangeland Grazing,Crop Production (Irrigated)	Aquatic Life	No
Phosphorus, Total	Crop Production (Irrigated),Rangeland Grazing	Aquatic Life	No
Sedimentation-Siltation	Loss of Riparian Habitat,Rangeland Grazing	Aquatic Life	No

**Figure 3.2**

- **Sarpy Creek:**

Impairment Information			
Probable Cause	Probable Sources	Associated Uses	TMDL Completed
Nitrate-Nitrite (Nitrite plus Nitrate as N)	Crop Production (Non-Irrigated),Grazing in Riparian or Shoreline Zones	Aquatic Life	No
Nitrogen, Total	Grazing in Riparian or Shoreline Zones,Crop Production (Non-Irrigated)	Aquatic Life	No
Phosphorus, Total	Grazing in Riparian or Shoreline Zones,Crop Production (Non-Irrigated)	Aquatic Life	No

**Figure 3.3**

### Geology & Groundwater

About 12,000 feet of sedimentary rocks, predominantly of marine origin, are exposed in the Area. They represent every geologic period except Silurian. Pre-Cambrian crystalline rocks are exposed only in the deepest part of the Big Horn Canyon.

Groundwater can consistently be found at depths less than 100 feet in the Big Horn and Little Big Horn River Valleys, although water quality can vary, and can often have issues with salts. Throughout the rest of the county, available groundwater and estimated depths vary greatly based off of existing geologic formations, and evidence of any other existing wells nearby. Existing wells that have been drilled in the county may or may not have a well log on file with the Montana Bureau of Mines and Geology (MBMG), which also makes determining well water quality and productivity difficult.

### **Air & Energy:**

#### Utility/Power Company – Areas of Coverage

- Northwest Energy – Electric utility company that serves portions of Big Horn County.
- Big Horn County Electric Cooperative- Electric utility company that serves portions of Big Horn County.
- Hardin Generating Station – This is a coal-fired power station about one mile north/northeast of Hardin.
- Powder River Energy Corporation – Based out of Gillette, WY, Powder River Energy Corporation services electricity to the extreme southeastern portion of Big Horn County (Decker and east).
- Montana-Dakota Utilities (MDU) Company – A subsidiary of MDU Resources Group, Inc. MDU Provides natural gas utility services for portions of Big Horn County.

Due to the significant distance from most power lines in rural Big Horn County, many stockwater projects rely on solar power or gas/diesel/propane generators. A small number of pumped irrigation projects in the irrigated valleys have also relied on generators as a source of power due to the cost of getting electric power to pumping sites.

#### Railroads

BNSF Railway – This railroad crosses through Big Horn County, somewhat adjacent to Interstate 90. There has also been a proposed railroad that would go up the Tongue River drainage and would primarily be used for transporting coal, but at this time the proposal is a long way from becoming a reality.

#### Main Highways

- Interstate 90 crosses through Big Horn County, with Interstate 94 located north of the county about 10 miles (I-90 and I-94 intersect at Billings, MT).
- Montana State Highway 313 & 47 crosses through Hardin, Saint Xavier, and Fort Smith.
- Montana State Highway 212 crosses east/west through Crow Agency and Busby. The “Old Hardin Road” portion of this highway goes from Hardin to Billings and roughly parallels south along I-90.
- Montana State Highway 314 travels south about two miles east of Busby and crosses through Kirby and Decker.
- Montana State Highway 384 goes northeast from Hardin through the Sarpy area into Treasure County.
- There is also a network of BIA-maintained highways and roads throughout the Crow Indian and Northern Cheyenne Indian Reservations.

#### Coal Mines

- Decker Coal Company – Located in southeastern Big Horn County, north of Decker, MT, and is near the Lighthouse Resources Decker Mine.
- Wolf Mountain Coal Company Inc. – Also located in southeastern Big Horn County, north of Decker, MT, and is near the Decker Coal Company.
- Absaloka Coal Mine – Located in northeastern Big Horn County and is owned by Westmoreland Mining LLC.

#### **Plants & Animals:**

##### Animal Feeding Operations (AFO’s)/Concentrated Animal Feeding Operations (CAFO’s)

Most of the AFO/CAFO’s in Big Horn County are considered small operations, and there are two permitted CAFO operations. There are numerous AFO/CAFO’s that are located directly adjacent to streams or other waterbodies with very little vegetative buffering between the corrals and the water source. Targeted funding towards relocating these operations would greatly benefit the water resources.

#### Wildlife

All land and waters provide habitat for wildlife. The quality of habitat is variable depending on the quantity, quality, and connectivity of food, cover/shelter and water, and adequate space. Elk and black bear can be found in scattered areas throughout Big Horn County. Although black bears usually stay in higher elevations, if late spring or early fall frosts have affected food sources, they can be found in lower elevations. Mule deer, white-tailed deer, and pronghorn can be found throughout the county. Bald eagles are regularly found throughout areas of Big Horn County. Bald eagles are considered a Special Status Species because, although they are no longer protected under the Endangered Species Act, they are protected under the Bald and Golden Eagle Protection Act of 1940.

The Northern Cheyenne Indian Reservation has had established hunting seasons in the past but seasons aren't being enforced at this time. The Crow Indian Reservation doesn't have established hunting seasons but hunting licenses on the reservation can be purchased through the Crow Tribe.

Big Horn County is home to core sage grouse habitat, located in southeastern Big Horn County, east of Decker, and also in extreme southwest Big Horn County, west of Pryor. Much of Big Horn County is also considered Historic Sage Grouse habitat, with areas of this historic habitat with confirmed active leks. In 2018, the existing sage grouse leks on the Crow Indian Reservation were successfully marked and inventoried by the Crow Tribe and Bureau of Indian Affairs staff.

The Montana Fish, Wildlife, and Parks' Grant Marsh Wildlife Management Area (WMA) occurs in the county seven miles north of Hardin. Activities such as boating, fishing, hunting, and wildlife viewing occur in the WMA. Visitors can hunt ducks, geese, mourning doves, ring-necked pheasant, and sharp-tailed grouse.

#### Fish

The first thirteen miles of the Big Horn River below the Yellowtail Dam are considered a blue ribbon trout fishery for brown and rainbow trout. Fishing and guiding makes up a considerable portion of the economy in Big Horn County. A number of fishermen, guides, and landowners in Big Horn County are very passionate about preserving the blue ribbon trout waters of the Bighorn River.

#### Threatened & Endangered Species (T&E) and Species of Concern (SOC)

As of 10/23/2018, the Crow Indian Reservation has the black-footed Ferret listed as an endangered species. The Crow Tribe and BIA have done recent work by Wild Horse Ridge (in between Pryor and Saint Xavier, MT), for a release of black-footed ferrets. The Northern Cheyenne Reservation has done similar releases in the past fifteen years in Rosebud County but has had limited success due to sylvatic plague killing both the ferrets and prairie dogs. As of 10/23/2018, there were no threatened or endangered species listed for the Northern Cheyenne Indian Reservation. The black-footed ferret is listed as an endangered species on the U.S. Fish and Wildlife Service's Threatened and Endangered species list for Big Horn County.

According to the Montana Natural Heritage Program website as of 2/5/2019, there were 10 mammals listed as Species of Concern (SOC): townsend's big-eared bat, black-tailed prairie dog, spotted bat, eastern red bat, hoary bat, black-footed ferret, little brown myotis, fringed myotis, merriam's shrew, and preble's shrew.

There were 20 birds listed as SOC: northern goshawk, golden eagle, great blue heron, burrowing owl, chestnut-collared longspur, veery, greater sage-grouse, yellow-billed cuckoo, black-billed cuckoo, bobolink, peregrine falcon, pinyon jay, cassin's finch, loggerhead shrike, lewis' woodpecker, clark's nutcracker, long-billed curlew, sage thrasher, green-tailed towhee, and brewer's sparrow.

There were five reptiles listed as SOC: spiny softshell, snapping turtle, plains hog-nosed snake, western milksnake, and greater short-horned lizard. One amphibian was listed as a SOC, the great plains toad.

There were two fish species listed as SOC: Yellowstone cutthroat trout, and sauger. The sauger's historical habitat used to reach into the Big Horn Canyon, but with the construction of Yellowtail Dam as well as various diversions along the Bighorn River, sauger are no longer found upstream past the Victory Irrigation Ditch diversion.

There were 26 plants listed as SOC: sweetwater milkvetch, barr's milkvetch, pottery milkvetch, Wyoming thistle, yellow beeplant, nine-anther prairie clover, Big Horn fleabane, Parry's fleabane, spotted joepy-weed, spiny hopsage, bush morning-glory, nuttall desert-parsley, bractless blazingstar, dwarf mentzelia, woolly twinpod, bur oak, persistent-sepal yellowcress, desert groundsel, Wyoming sullivantia, soft aster, slim-pod Venus'-lookingglass, nannyberry, geyer's onion, heavy sedge, tall dropseed, and letterman's needlegrass.

### **Section III. Current State of the Natural Resources in the County-**

The Big Horn Conservation District (BHCD), located in Hardin, Montana is a critical partner with local water quality and quantity issues. Through the more than 50 years of its existence, the Big Horn Conservation District has partnered with many businesses, units of state and federal government, and individuals to insure the water quality and water quantity within Big Horn County, Montana.

Recent examples are:

- 1) Tongue River Information Project, a project to monitor the quality of water produced from methane gas wells in the coal-bed methane gas production area of southern Montana that is used for agricultural irrigation. The project was funded initially by Fidelity Exploration & Production Co., a coal-bed methane gas production company. Now funded by the Montana Bureau of Oil and Gas Conservation, a bureau of the Montana Department of Natural Resources and Conservation, the continuing project involves the Big Horn Conservation District, professional soils people and 13 ranchers and farmers. The project monitors crop production and changes in soil quality resulting from use of coal-bed methane production water for irrigation, and the BHCD keeps monitoring equipment kits available to the public to monitor their wells.
- 2) The BHCD has been supportive of Special Initiative projects organized by the Hardin NRCS Field Office and funding through the Environmental Quality Incentives Program (EQIP), as well as the recent Regional Conservation Partnership Program (RCPP) Yellowstone Regional Ag Sustainability Project (YRASP) that was approved for funding in 2016, with MillerCoors listed as the main project partner. The purpose of RCPP YRASP is to define a path towards agricultural sustainability through progressive conservation practices and sound conservation planning. This project seeks to define best management

practices for irrigated agricultural producers in Big Horn, Carbon, and Yellowstone counties of Southern Montana that would lower natural resource consumption and degradation, and is funded for five years.

3) The North Valley groundwater study is a project located within the corridor of the Bighorn River from Hardin, Montana north to the Big Horn County line, a distance of 20 miles. Initiated by the Big Horn Conservation District and funded by the Montana Department of Natural Resources through a grant provided by the Montana Legislature, partners in the study included the Montana Bureau of Mines and Geology, a unit of Montana Tech of the University of Montana; Montana Department of Natural Resources and Conservation; and 40 landowners. Seven groundwater monitoring wells were drilled, and 86 groundwater locations were sampled several times: 77 wells, 6 streams and 3 springs. Study results are available to the public on the MT Bureau of Mines Ground Water Information Center site:

<http://mbmggwic.mtech.edu/>

4) State-line Ground-water Monitoring Network for the Tongue River and Powder River Watersheds, a project initiated by the Big Horn Conservation District to monitor water quantity and water quality along the state line border with the State of Wyoming. Funded by the Montana Legislature, the purpose of the study is to document baseline data in the Montana portion of the Powder River Basin where coal-bed methane production is increasing. Partners with the Big Horn Conservation District were Rosebud and Powder River Conservation Districts, the U.S. Bureau of Land Management, Montana Department of Natural Resources and Conservation, the USDA Forest Service, the Montana Bureau of Mines and Geology, the Northern Cheyenne Indian Tribe and the United States Geological Survey. Hydrogeologic data were collected at 204 wells, 13 springs and two streams.

5) Montana Regional Coal-bed Methane Program, a project initiated by the Big Horn Conservation District and funded by the Montana Legislature, is a current project to continue monitoring and collecting data begun in the State-line Ground-water Monitoring Network for the Tongue River and Powder River Watersheds. Additional education activity specific to this project is the opportunity for landowners and producers in the area to learn to monitor and document their individual groundwater data and to correctly use monitoring equipment placed in locations throughout the Powder River Basin for individuals to borrow and use. Partners in this current project remain the same as the previous project.

#### **Section IV. Natural Resource Problems and Desired Future Outcomes:**

##### **What Has Been Done To-Date in Big Horn County:**

**Please refer to Figure 5.6, “Big Horn County IDEA Map for conservation practices applied in Big Horn County from 2008-2018”**

**Dry Cropland:** Reduced and No-Till systems have been adopted through much of the county over the past 10 to 15 years. Winter Wheat-Chemical Fallow are still common cropping rotations, although farmers have been experimenting more with other crops on dryland, such as: sunflowers, safflower, pea, and corn. There have also been a handful of farmers who have tried to increase their cropping diversity through cover crops, and the Big Horn Conservation District continues to offer cost-share incentives to farmers who are willing to experiment with cover crops on their farming operations.



**Irrigated Cropland:** There has been extensive financial and technical assistance offered through the Hardin and Crow Agency NRCS Field Offices for irrigation improvement projects, especially along the Big Horn River Valley north and south of Hardin. This has included conversion from open-ditch, flood-irrigation to buried irrigation pipe, gated pipe, center pivot, and most recently, subsurface-drip irrigation (SDI). Center pivot and SDI methods of irrigation have the ability to provide a greater ability for farmers to practice soil health-related practices on cropland, such as reduced tillage, cover-cropping, and aftermath grazing. Reduced tillage on irrigated cropland has been encouraged and promoted, with some success in areas of irrigated land, and other areas remaining in a conventional tillage operation. Cover crops have also been utilized in scattered areas of irrigated cropland.

**Pasture:** Stockwater and crossfencing projects have been consistently implemented on pastureland areas throughout Big Horn County to facilitate grazing management and improve rangeland health. The need remains for more of these projects. Prescribed Grazing has been successfully implemented on various ranches in the county, with several producers practicing holistic and regenerative grassland management; but widespread adoption of grassland management is still needed. On irrigated pasture, some irrigation improvement projects have also been implemented.

**Rangeland:** Stockwater and crossfencing projects have been consistently implemented on rangeland areas throughout Big Horn County, and the need for more of these projects remains. Prescribed Grazing has been successfully implemented in various ranches in the county, with several producers practicing holistic and regenerative grassland management; but widespread adoption of rangeland management is still needed.

**Headquarters:** There continues to be a need for Animal Feeding Operation (AFO) relocations from nearby sources of water, as there have only been a handful of AFO/CAFO projects completed in Big Horn County. Historically, many farmsteads were established adjacent to water sources in order to provide livestock access to water. Now, with widespread availability of power and ability to pipe water significant distances, there is a continuing need to relocate AFO/CAFO's from surface water.

**Forestland:** Due to a lack of available lumber mills within reasonable trucking distance, there has been little forest stand improvement projects completed in the county. There will continue to be a need for this, especially in order to help mitigate fire danger and improve the grassland resource. There has also been a steady increase of conifer encroachment in areas between forest and rangeland. These areas would benefit from brush management and conifer thinning projects.

#### **Resource Inventory – Soil Erosion:**

- **Irrigated Cropland:** Both wind and water-induced erosion have been a resource concern on irrigated cropland. This issue has been caused partly from intensive tillage practices used on irrigated cropland, as well as a lack of irrigation water management. According to the Soil Tillage Intensity Rating (STIR) from our Revised Universal Soil Loss Equation (RUSLE2), conventional tillage practices with a typical Sugar Beet/Small Grain/Small Grain cropping rotation on irrigated cropland commonly have a STIR range of 120 to 200. Over the years, irrigated farmers have begun to adopt more reduced tillage methods on irrigated cropland and have been able to keep these STIR ratings on irrigated cropland closer to 85-120. Existing crop



rotations and existing irrigation infrastructure has been cited as barriers to being able to lower STIR ratings on irrigated cropland.

- **Dry Cropland:** With common cropping rotations on dry cropland involving a small grain and fallow, soil erosion has been an issue off and on. No-Till cropping methods have been largely adopted on dry cropland throughout the county, although there are still some producers in parts of the county who have yet to adopt this residue management method. Common no-till STIR ratings on a winter wheat-chemical fallow rotation range from 5 to 15. Diversifying cropping rotations on dry cropland has been suggested, although challenges lie with markets to sell other crops, as well as climactic limitations on spring-seeded crops. Recently, the use of fall seeded specialty crops such as winter pea and winter canola have been seen due to their ability to use winter and early spring precipitation.
- **Rangeland & Pastureland:** Erosion issues have been found on range and pasture in fields that have experienced overgrazing, especially along water sources where livestock have congregated.

### **Resource Inventory – Soil Quality**

- **Irrigated Cropland:** Intensive tillage operations on small grains and sugar beet rotations (STIR range of 120-200), as well as a lack of irrigation water management, over the years has degraded soil quality in terms of organic matter depletion and soil compaction. Soil Condition Indexes (SCI) in a typical small grain, small grain, sugar beet rotation has been less than zero. Salinity has also been an issue on some irrigated cropland fields; some of these concerns have been solved or mitigated through cropping rotations, adding perennial crops, or addition of soil amendments.
- **Dry Cropland:** Salinity concerns on dryland crop has occurred over the years, with some of these saline seeps continuously growing over the years. Crop/fallow rotations, lack of crop diversity, and existing soil conditions have all contributed to salinity problems on cropland. Some of these issues have been resolved or mitigated by seeding fields or portions of fields back to a perennial crop or grass. Addition of soil amendments to dryland crop has been limited due to cost.
- **Rangeland:** Long term overgrazing has led to a degradation of soil on rangeland, especially with compaction and decrease of organic matter levels. Implementation of prescribed grazing, as well as structural and vegetative practices that can facilitate the implementation of prescribed grazing, have helped to stem the loss of soil quality.

### **Resource Inventory – Water Quality and Quantity**

- **Irrigated Cropland:** Irrigated cropland in the Big Horn River valley have been lucky to have relatively few issues related to water quantity, with the Yellowtail Dam mitigating this concern in regard to drought and flood control. Other irrigation systems in the county are a little more subject to irrigation water limitations later in the growing season. Irrigation water in Big Horn County can be affected by moss problems due to the clarity of the irrigation water. Moss can plug irrigation equipment, although some irrigation companies and ditches mitigate this problem by requiring the moss to be taken with the irrigation water and are subsequently removed with moss filters. Irrigation tailwater leaving crop fields can have issues with sediment

and nutrient levels, which can be caused by intensive tillage practices, inefficient irrigation structures, lack of irrigation water management, and/or lack of nutrient management.

- **Dry Cropland:** With a typical 13 to 15 inch precipitation range on most of the dry cropland in Big Horn, water quantity can be a limiting factor in crop productivity. Ensuring adequate residue cover on the soil surface can be the best method for conserving soil moisture.
- **Range and Pasture:** Water quantity and quality are two of the most limiting factors for grazinglands utilization, as both are needed to safely manage livestock. Land located in and adjacent to the Big Horn and Little Bighorn River valleys have the best chance for quality groundwater sources; other locations in the county can vary significantly in groundwater availability and quality. Another concern is degradation of water quality in existing springs, especially from uncontrolled livestock traffic. Developing these springs can help preserve the integrity of the spring itself and also provide good quality stockwater.
- **Headquarters:** Big Horn County has at least 200 small livestock operations with cattle, horses, and other animals. Many of these are located near waterways and deliver nutrients, organic material, and potential pathogens downstream. These livestock operations are usually not monitored by MT DEQ and don't require CAFO permits. A high percentage of such operations could be considered low management. The headquarters and barn areas are typically muddy, ponded and have surface run-off with substandard housing and wintering areas. In some cases, livestock are not excluded from waterways or wetland access. Many of these small AFO's would benefit from being moved away from the nearby water sources, as well as having off-site water sources installed in order to prevent livestock access from rivers and creeks.

### Resource Inventory – Plants

- **Irrigated Cropland:** In irrigated river valleys, especially along the Big Horn River valley, native cottonwood trees have steadily decreased over the years. Part of this decrease can be attributed to the construction of Yellowtail Dam, which has since mitigated flood risk in the valleys, and has prevented the spread and propagation of additional cottonwood seedings. Over the years, existing cottonwood trees between crop fields have been cut down, as they have been thought to be in the way of larger and larger farm machinery that is working the fields.
  - The risk of Palmer Amaranth spreading to Montana from North Dakota or Wyoming may be a concern in the future, as it could significantly affect pulse and row crops grown here.
  - Fusarium head blight has recently become a problem on irrigated cropland and can seriously impact small grains. Fusarium can produce deoxynivalenol (DON); levels of DON that exceed 1ppm are considered by the US Food and Drug Administration as unsuitable for human consumption; and levels exceeding 3ppm are unsuitable for livestock consumption. This disease is seen more often in areas that are growing corn (the fungal spore can travel through the wind to neighboring fields miles away). MSU Extension recommends tillage or burning of corn residues in order to prevent the formation and spread of Fusarium. Management of crop rotations are equally as important as residue management, and it is important to ensure there are also cool and warm-season broadleaves present in the cropping rotations to help prevent an excess of residue buildup on the soil surface. Management of crop rotations are easier said than

done, though, due to the availability of local markets in which to market alternative crops.

- **Dry Cropland:** Pest pressure from wheatstem sawfly, and wild rye have consistently been pest issues on dry cropland, especially with the historic winter wheat and fallow rotations. Varieties of winter wheat have been developed that are solid-stemmed and are considered resistant to sawfly but are also consistently less productive than other varieties. Cropping rotation and residue management have also been cited as other methods for preventing sawfly from infesting wheat fields. Residue management typically calls for either no residue available to house sawfly larvae, or to keep wheat stubble as high as possible (usually from using a stripper header), in order to encourage natural predators to the sawfly to keep their damage at bay.
- **Rangeland:** Invasive winter annual grasses, such as cheatgrass, bulbous bluegrass, and ventenata have been problems on rangeland, and have had significant impacts on forage quality and quantity as they have replaced native perennial grasses and forbs. Prescribed grazing, and possibly intense renovation of significantly affected pastures, are needed throughout the county. Other noxious weeds such as sulphur cinquefoil, spotted knapweed, and leafy spurge have been found on rangeland areas scattered through the county as well.
- **Pastureland:** Invasive winter annual grasses, as well as some noxious weeds such as sulphur cinquefoil and spotted knapweed have been issues on some pastureland, especially dryland pasture. Low biomass production on pasture has been an issue, especially in pasture fields that have a monoculture of grasses, such as crested wheatgrass or smooth brome. Renovation of existing pastures would be beneficial in addresses plant pest pressure and forage production.
- **Forestland:** Since there is a significant lack of available timber markets nearby Big Horn County, there hasn't been timber harvesting in the county, and thus some areas of forested land has become overgrown, which has also significantly affected forage production in grazed forestland.

### **Resource Inventory – Animals**

- **Irrigated Cropland:** Irrigated cropland typically lacks wildlife habitat, especially on fields that are under conventional tillage operations, which leaves very little residue cover on the soil surface.
- **Dry Cropland:** The residue and tillage management that has been implemented on dryland crop has been beneficial for wildlife habitat. Stripper stubble, which is accomplished at harvest time through a specialized combine header that strips the wheat seedhead from the stem of the plant has been utilized in limited areas on dryland crop, which also provides additional cover for upland wildlife. Cover crops on dry cropland can be used to provide some supplemental forage for livestock.
- **Rangeland:** Most of the animal resource concerns, such as Forage Quantity, Water Quantity, and Water Quality, have been cited above. Fish & Wildlife Habitat concerns associated with overuse of riparian areas/water sources, overgrazing of rangeland vegetation, noxious weeds, and invasive annual grasses on rangeland, and forest health exist, especially in sage grouse habitat. Extreme southeastern and extreme southwestern Big Horn County both have portions of core sage grouse areas, and approximately 2/3's of the rangeland in Big Horn County are located in historic sage grouse habitat. Practicing prescribed grazing and treating noxious weeds and invasive annual grasses on rangeland acres will help protect sagebrush habitat for sage grouse and other sagebrush species.

- Pastureland: Most of the Animal resource concerns cited for rangeland are also applicable to pasture land uses. Plant productivity on pastureland could also be addressed through pasture renovation and prescribed grazing.
- Forestland: Lack of local available timber markets nearby Big Horn County, has prevented much timber harvesting in the area for the last 10 to 15 years, resulting in a long-term decrease in livestock and wildlife forage availability and an increase in fuel loads and wildfire risk.

## Section V. Prioritization of Natural Resource Problems and Desired Outcomes

### FY2022 Big Horn County and Crow Tribal Local Working Group Meetings

Due to COVID-19 and restrictions on holding public meetings, the LWG questionnaire was sent by the BHCD to customers in Big Horn County. The responses are below (Figure 5.0):

FY2022 Big Horn County LWG Responses

Demographics	Number
Farmer	7
Rancher	8
Private Landowner	10
Tribal Landowner	3
Native American	2
Tribal Entity	1
Nonprofit Group	
Other	1

Resource Concerns	Landuse						Landuse Not Specified	Location
	Pasture	Rangeland	Forestland	Irrigated Crop	Dryland Crop	Other		
Soil Erosion				1			3	Wind erosion north of Hardin; North Valley
								Big Horn River Valley, Little Big Horn River Valley, Pryor Creek Valley; Salinity Issue West of Hardin on Dry Cropland; Salinity issue on pasture and irrigated crop North of Hardin; North Valley
Soil Quality Degradation	1			1	1		5	
								Big Horn River Valley, Little Big Horn River Valley, Pryor Creek Valley; Fly Creek; Irrigation Water on Hay Creek; Wolf Mountains; Little Big Horn River and its Tributaries; Pryor Creek and Pryor Mountains
Water Quantity	3	3	1	1			4	
								Big Horn River, Little Big Horn River, Pryor Creek; Fly Creek; Hay Creek and East Pryor; Little Big Horn River and its Tributaries
Water Quality	2	2					3	Hay Creek and East Pryor; Countywide; Wolf Mountains; Pryor Mountains (Prairie Dog Destruction)
Degraded Plant Condition	2	2	1				4	
Inadequate Fish & Wildlife Habitat							2	Little Big Horn River; Little Big Horn River and its Tributaries
Livestock - Inadequate Feed & Forage	1	1	1				3	Location not specified but listed "drought"; Wolf Mountains; Pryor Mountains (Prairie Dog Destruction)
Livestock - Inadequate Livestock Shelter								
Livestock - Inadequate Livestock Water							2	East Pryor and Bueavais Creek

Suggested Education and Outreach
What is the status on the water compact since its passage in 2010?
Prairie Dog Management

Any Additional Concerns Noted
During irrigation season water is being over-used. Too much water is being taken out of rivers or creeks. They say their system's are sustainable, but it does not address the amount they use.
Rain Dances
We need additional water supply for domestic as well as for agricultural purposes. Water Supply is getting critical.

Figure 5.0

These questionnaire responses were reviewed at the April BHCD Board Meeting, and it was recommended to keep the FY2021 LWG recommendations.

#### FY2021 Crow Tribal Local Working Group Meeting

*The Fourth Annual Crow Tribal LWG meeting convened at 12:30pm at the Little Big Horn College Library Programs Room in Crow Agency, MT on Tuesday, March 10th, 2020. Shalaine Watson, USDA-NRCS Acting Supervisory District Conservationist for the Crow Agency, Hardin, and Billings Work Unit, moderated the meeting.*

*Ms. Watson reviewed the Local Working Group's purpose, and the direction that NRCS is working towards with Montana Focused Conservation. Minutes from the 2021 Big Horn County LWG meeting were provided. A map of Big Horn County was drawn to describe where major watersheds are located within the county. A handout with the listed potential resource concerns was given to all the attendees to be used as a tool to help attendees come up with specific resource concern titles.*

*The meeting was then opened for attendee input regarding concerns throughout the Crow Reservation, and discussion ensued. An attendee asked who is responsible for irrigation water management on the reservation by Wyola. He commented that he is having a problem with his irrigation water and BIA and a neighboring ranch keep bouncing him around on who to talk to. Another attendee asked if NRCS knew the status of the Phillip 66 gas spill that occurred between Wyola and Willow Creek. He asked if anyone is testing the soil or the groundwater in that area. The same attendee brought up water quality in Willow Creek Dam southwest of Lodge Grass. He asked if we had information on the Mercury levels and he commented that he does not eat fish out of that waterbody anymore. He was also concerned about surface water quality resulting from agricultural practices involving fertilizers. Groundwater quality on his family's land over time has become undrinkable for livestock and humans. The topic came up about if pesticide use is linked to human health cases on the reservation. Attendees were concerned that pesticides are not being applied at proper rates and is leading to pesticides contaminating surface and ground water. The attendees have heard that these pesticides are causing cancer in individuals on the reservation. The attendees were interested in having studies conducted to verify if these pesticides are causing cancer. The attendees were unaware if the Crow EPA are testing water quality. It was noted that Little Big Horn College has some monitoring in place for studying groundwater. It was noted that one of the attendees has noticed that there seems to be more human health problems during high moisture seasons. One attendee left the meeting after giving his input. An attendee asked what NRCS is doing about Climate Change. He asked if the agency is adjusting conservation practices to shift to more drought resistant practices and plant species. He noted that stock water quantity is limited in the Good Luck Creek area. He asked on availability to put in ponds, reservoirs, spring developments or wells. Prairie dogs were listed as a concern. It was suggested doing a workshop or getting a program for prairie dog control. Noxious weeds were mentioned, specifically hemlock in the Good Luck Creek area. Another attendee left the meeting after giving his input. One attendee asked if pesticides can cause health problems in human if ground water is used for washing dishes or showering. He noted that he does not consume any water from his current well.*

*After discussion had concluded, resource concerns were listed, and it was decided to make **Water Quality on rangelands the number one priority, and Water Quantity on rangeland the second priority.** The local ranking questions were not discussed.*

*Seeing no more discussion, the Local Working Group meeting adjourned at 1:20pm.*

*Respectfully Submitted,*

*Velma Pickett*

*Crow Tribal Local Working Group Chairwoman*

#### FY2021 Big Horn County Local Working Group Meeting

Held February 18<sup>th</sup>, 2020 at the MSU Big Horn County Extension Office in Hardin, MT, the minutes from this meeting are as follows:

*Members of the Big Horn County Local Work Group met at the MSU Extension at 12:00 p.m. to discuss the FY2020 NRCS program(s) and identify Big Horn County natural resource concerns. Members attending are listed on the signature page, which is attached to and made a part of these minutes.*

*Following introductions Shalaine, NRCS District Conservationist, reviewed the purpose of the Local Work Group, noting that part of the purpose of the Local Work Group is to discuss general resource concerns and to identify specific resources concerns which can be used to direct NRCS programs and to possibly direct conservation district grant activities. Montana Focus Conservation Planning (MFC) and the new farm bill were reviewed.*

*She then reviewed the current NRCS programs, including the various funding pools and other potential funding sources. FY2020 Local Working Group recommendation were reviewed.*

*Evan Van Order, NRCS Tribal Conservationist, then reviewed Big Horn County on a watershed basis to identify Natural Resource Concerns present. Some of these natural resource concerns include: 1) grazing lands; 2) irrigation efficiencies/water quality; 3) soil protection and improvement; 4) forestry, 5) invasive species, and 6) sage grouse.*

*Maria reviewed the results of the questionnaire survey.*

*Evan reviewed current Targeted Implementation Plans (TIPs) in Big Horn County.*

*Following discussion, the Local Work Group agreed to recommend that the **#1 Resource Concern this year be designated Plant productivity and health on rangeland and riparian**, followed by **#2 Soil quality degradation on all landuses (organic matter depletion)**.*

*The Local Work Group agreed to continue as before designating continued support for rangeland and cropland soil health and water quality education within Big Horn County as a priority, including invasive species awareness and control. The work group also agreed to encourage support for more secure lease agreements that encourage soil health within rangeland and cropland systems.*

*As there was no further business to come before the group the meeting adjourned at 1:40 p.m.*

*Respectfully submitted,*



Maria Hopkins  
District Manager  
Big Horn Conservation District

FY2020 Big Horn County Local Working Group Meeting

Held February 7<sup>th</sup>, 2019 at the Big Horn County USDA Service Center in Hardin, MT, the minutes from this meeting are as follows:

*Members of the Big Horn County Local Work Group met at the USDA building at 12:35 p.m. to discuss the FY2020 NRCS program(s) and identify Big Horn County natural resource concerns. Members attending are listed on the signature page, which is attached to and made a part of these minutes.*

*Following introductions Seanna Torske, NRCS District Conservationist, reviewed the purpose of the Local Work Group, noting that part of the purpose of the Local Work Group is to discuss general resource concerns and to identify specific resources concerns which can be used to direct NRCS programs and to possibly direct conservation district grant activities.*

*Seanna then reviewed the current NRCS programs, including the various funding pools and other potential funding sources. She then reviewed Big Horn County on a watershed basis. Natural resources concerns for seven (7) areas of the county were again reviewed. They included: 1) grazing lands; 2) irrigation efficiencies/water quality; 3) soil protection and improvement; 4) forestry, 5) invasive species, and 6) sage grouse.*

*Following discussion, the Local Work Group agreed to recommend that the #1 Resource Concern this year be designated Excess plant pest pressure on Rangeland, followed by #2 Soil quality degradation on irrigated cropland (organic matter depletion). The #1 ranking question selected was Is this the applicant's first EQIP or CSP contract? with all available points designated to that question. Following final discussion Molly motioned, seconded by Jerry, that the above resource concerns and ranking question be designated by the Local Work Group for FY 2020 recommendations. Motion carried - unanimous.*

*The Local Work Group agreed to continue as before designating continued support for rangeland and cropland soil health and water quality education within Big Horn County as a priority, including invasive species awareness and control, with a special focus on small acreage landowners. The work group also agreed to encourage support for more secure lease agreements that encourage soil health within rangeland and cropland systems.*

*As there was no further business to come before the group the chairman declared the meeting adjourned at 2:10 p.m.*

*Respectfully submitted,*

Maria Hopkins  
District Manager  
Big Horn Conservation District

FY2020 Crow Tribal Local Working Group Meeting

In order to prioritize resource concerns specific to the Crow Indian Reservation, the Crow Tribal Local Working Group Meeting is also held annually in order to gain the public's input. The Third Annual Crow Tribal LWG meeting was held on March 5<sup>th</sup>, 2019 at the Little Big Horn College in Crow Agency, MT. The minutes are as follows:

*The Third Annual Crow Tribal LWG meeting convened at 12:29pm at the Little Big Horn College Library Programs Room in Crow Agency, MT on Wednesday, March 5th, 2019. Seanna Torske, USDA-NRCS Supervisory District Conservationist for the Crow Agency, Hardin, and Billings Work Unit, moderated the meeting.*

*Mrs. Torske reviewed the Local Working Group's purpose, LWG fact sheets were provided to the workshop attendees. Minutes from last year's LWG meeting were provided. A map of the Crow Reservation was projected on the screen, with watersheds listed, and printouts of the same map were provided to workshop attendees in case there were any specific areas where a resource concern was of particular importance. A printout titled Montana Resource Concerns and Planning Criteria for Conservation Planning was given to all the attendees, which listed potential resource concerns and was used as a tool to help attendees come up with specific resource concern titles.*

*Before going into participant input on local resource concerns, Mrs. Torske had each of the attendees introduce themselves. The meeting was then opened up for attendee input regarding concerns throughout the Crow Reservation, and discussion ensued. An attendee mentioned a spring outside of Pryor along Lost Boy Creek had once been used for cultural ceremonies but has since become unusable for drinking purposes. Water Quality along Pryor Creek and other water bodies on the Crow Reservation was discussed. Mercury levels in Willow Creek Dam southwest of Lodge Grass was mentioned. Beaver dams in Pryor Creek have affected water quantity for downstream people. Another attendee had mentioned they felt irrigators along Pryor Creek had been using more than water than is allotted through their water rights. Noxious and invasive weeds throughout the Crow Reservation were discussed. It was also noted that it was important to protect and promote cultural significant plants on the Crow Reservation. Public participation in Local Working Group meetings was also discussed.*

*After discussion had concluded, resource concerns were listed, and it was decided to make Water Quality on rangeland the number one priority, and Water Quantity on rangeland the second priority. The Local Working Group attendees also wanted to make note that they were supportive about education regarding noxious and invasive weed species; as well as protecting and promoting culturally significant plants on the Crow Reservation. The LWG attendees wished to leave the same local ranking questions as last year, which were: 1.) Will water quality be addressed by limiting livestock access to springs, perennial streams, and rivers? (125 Points), and, 2.) Will Brush Management, Herbaceous Weed Control, and/or Prescribed Grazing be planned? (125 Points).*

*Seeing no more discussion, the Local Working Group meeting adjourned at 1:33pm.*

#### Local Working Group Questionnaire

Following recommendations made at the Crow Tribal LWG meeting on March 5<sup>th</sup>, 2019, USDA-NRCS Staff developed the following questionnaire, and mailed/emailed it out to people who live and/or operate ag operations on the Crow Indian Reservations (approximately 125 people received the mailed questionnaire, and about 45 people received the emailed questionnaire). The purpose of this



questionnaire is to continue a locally-led process to highlight resource concerns in the area, and to provide a voice to people who may be unable or unwilling to attend a public forum. The Big Horn Conservation District plans to utilize a similar format for this questionnaire for the FY2021 Local Work Group. The original format for the questionnaire is as follows (figures 5.1 and 5.2):

**Fiscal Year (FY) 2020 Local Working Group Questionnaire**

Name (Optional): \_\_\_\_\_

Are you one or more of the following (check all that apply):

- ☐ Rancher
- ☐ Farmer
- ☐ Private Landowner
- ☐ Tribal Landowner
- ☐ Native American
- ☐ Tribal Entity
- ☐ Nonprofit Group
- ☐ Other: \_\_\_\_\_

**Please select up to three resource concerns** you feel are an issue on the Crow Reservation, circle the land use these resource concerns are associated with, as well as the general geographic location in the Crow Reservation these may be located (Pryor Creek, Wolf Mountains, Big Horn River, etc.):

- ☐ Soil Erosion (Wind, Water, Gully, Irrigation-Induced, etc.)
  - ☐ Landuse: Pasture, Rangeland, Forestland, Irrigated Cropland, Dry Cropland, Other
  - ☐ Location:
- ☐ Soil Quality Degradation (Organic Matter Depletion, Compaction, Salinity, etc.)
  - ☐ Landuse: Pasture, Rangeland, Forestland, Irrigated Cropland, Dry Cropland, Other
  - ☐ Location:
- ☐ Water Quantity (Stockwater, Irrigation Water, etc.)
  - ☐ Landuse: Pasture, Rangeland, Forestland, Irrigated Cropland, Dry Cropland, Other
  - ☐ Location:
- ☐ Water Quality (Sediment, Excess Nitrogen, Manure, etc.)
  - ☐ Landuse: Pasture, Rangeland, Forestland, Irrigated Cropland, Dry Cropland, Other
  - ☐ Location:
- ☐ Degraded Plant Condition (Weeds, Low Production, Overgrazing, etc.)
  - ☐ Landuse: Pasture, Rangeland, Forestland, Irrigated Cropland, Dry Cropland, Other
  - ☐ Location:
- ☐ Inadequate Fish & Wildlife Habitat
  - ☐ Landuse: Pasture, Rangeland, Forestland, Irrigated Cropland, Dry Cropland, Other
  - ☐ Location:
- ☐ Livestock- Inadequate Feed & Forage
  - ☐ Landuse: Pasture, Rangeland, Forestland, Irrigated Cropland, Dry Cropland, Other
  - ☐ Location:

**Figure 4.0**

- Livestock – Inadequate Livestock Shelter
  - Landuse: Pasture, Rangeland, Forestland, Irrigated Cropland, Dry Cropland, Other
  - Location:
- Livestock – Inadequate Livestock Water
  - Landuse: Pasture, Rangeland, Forestland, Irrigated Cropland, Dry Cropland, Other
  - Location:

The Hardin and Crow Agency NRCS Field Offices are always looking for opportunities to provide education and outreach to the producers on the Crow Reservation. Do you have any suggestions for future workshop/meeting topics to discuss?

Do you have any other additional concerns you would like to share with the Local Working Group?

Would you like us to send you information regarding any future workshops, meetings, or NRCS Farm Bill Programs? If yes, please include your name, mailing address, and email address, if applicable, below, and we will add you to our mailing lists.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Email: \_\_\_\_\_

This questionnaire can be returned to either the Hardin or Crow Agency NRCS Field Offices at the following addresses:

USDA-NRCS  
724 Third Street West  
Hardin, MT 59034

USDA-NRCS  
PO Box 699  
Crow Agency, MT 59022

Crow FO Physical Location: Little Big Horn College  
Student Union Building, Room 205  
Crow Agency, MT

If you have any questions regarding this questionnaire, please contact Seanna Torske, USDA-NRCS Supervisory District Conservationist, by calling: (406) 629-3220, or email: [seanna.torske@usda.gov](mailto:seanna.torske@usda.gov).

**Figure 4.1**

## **Section VI. Focused Conservation Strategies and Education/Outreach**

**Targeted Implementation Plans (TIP)** – Some of these plans are potential TIP proposals, current TIPs that have been approved by Montana USDA-NRCS State Leadership Team will be marked as funded, and more information regarding funded TIP proposals can be found here:

<https://www.nrcs.usda.gov/wps/portal/nrcs/mt/programs/mfc/>, and clicking on “What’s Available in My County?”.

### **Irrigation Improvement (FUNDED)**

- **Purpose:** Assist landowners by improving application efficiency of irrigation systems on existing irrigated cropland in Big Horn and Yellowstone Counties.
- **Primary Resource Concern Addressed:** Water: Excess/Insufficient Water – Inefficient use of irrigation water
- **Location:** Irrigated Cropland as indicated on the project map in Big Horn and Yellowstone Counties. The irrigated cropland in the two-county area totals a little less than 310,000 acres in two distinct river drainages that are all part of the Yellowstone River Drainage.
- **Summary:** This project is proposed to cover six years from FY2020 to FY2025. EQIP funding will be needed for FY2020-2022, and FY2023-2025 will be used for contract implementation and monitoring. The purpose of this project will primarily help offset the costs of installing buried drip tape irrigation and is expected to address the Irrigation Efficiency resource concern. The main practices will be (441) Irrigation System, Microirrigation, and (442) Sprinkler System, Center Pivot System, as well as some facilitating, vegetative, and management practices.
- **Goals:** Goals to accomplish through this project include: 5 EQIP contracts per county, totaling 10 EQIP contracts on approximately 1216 acres of irrigated cropland, resulting in an estimated \$1.6 million of EQIP funding needed over the six years of this project.
- **Monitoring and Evaluation:** (587) Structure for Water Control, Flow Meter, and (449) Irrigation Water Management will either be planned or contracted for each of the projects, allowing the participant to monitor and record their irrigation water use on the project fields. Annual Contract Status Reviews will be completed twice yearly on each funded project for the duration of the contract. The installed projects will also be utilized for Field Day tours, in order to provide outreach and education to local farmers who are also interested in improving their irrigation efficiency.
- **Partners:** Yellowstone Conservation District, Big Horn Conservation District, Montana State University Extension, Montana Bureau of Mines and Geology, and Private Landowners.

### **Big Horn County Ventenata Control (FUNDED)**

- **Purpose:** The purpose of this project is to assist landowners in proactively addressing control of Ventenata in Big Horn County through proper rangeland management, education, and chemical control methods before this invasive grass becomes widespread.
- **Primary Resource Concern Addressed:** Degraded Plant Condition – Excessive Plant Pest Pressure
- **Location:** Rangeland, Pastureland, and Grazed Forest within the Big Horn County Boundary is the proposed project area, with Priority 1 Area consisting of Rotten Grass Creek and Soap Creek

Watersheds, and Priority 2 Area consisting of Lodge Grass Creek, Upper Little Bighorn River, Owl Creek, and Tongue River-Badger Creek Watersheds.

- **Summary:** Invasive annual grass species such as Ventenata (also referred to as African Wiregrass), has begun to raise concern on Montana ranches, especially in Big Horn County. Controlling invasive and noxious weeds has been a regular concern at Local Work Group meetings, and this project seeks to control Ventenata in Big Horn County, as well as providing education to local ag producers and landowners on identification and control of Ventenata. The proposed timeframe for this proposal would cover five years. The proposal would cover Fiscal Years 2019-2023. An EQIP signup in Fiscal Years 2019-2021 and would leave FY2022 and 2023 as implementation and monitoring years. We would request \$150,000 of EQIP funding for this project in order to fully implement it over the five-year timespan.
- **Goals:** (315) Herbaceous Weed Treatment on at least 500 acres; and, (528) Prescribed Grazing management on at least 20,000 acres.
- **Monitoring and Evaluation:** Contract Status reviews will be performed twice-yearly during the contract duration, and on the fifth year of this project NRCS would complete an in-depth review and project report to document implementation. NRCS would also provide a report on the project at local workshops. NRCS will also set up photo point monitoring on the areas of control and will plan to use these points in order to document long-term control efficacy. The photo monitoring will also be able to be used for reports and progress reviews.
- **Partners & Alternative Funding:** Big Horn Conservation District, Big Horn Weed Control District, Montana State University Extension Big Horn County, and Private Landowners.
  - The Big Horn Conservation District has the ability to apply for the Montana Department of Natural Resources and Conservation (DNRC) HB 223 grant program to assist landowners and USDA-NRCS in providing outreach and education to local landowners. The Big Horn County Weed District Coordinator has the ability to provide some of the listed approved chemicals through their chemical cost-share program for Big Horn County residents.

#### Spring Development Protection and Improvement

- **Purpose:** Provide assistance to producers with protecting existing springs through protection and development of these springs.
- **Primary Resource Concern Addressed:** Water Quality Degradation – Excess Nutrients in Surface Waters
- **Location:** Big Horn County, with Prioritization given to the Little Big Horn Watershed.
- **Summary:** Covering four years, this TIP would seek to provide EQIP assistance to producers to protect and develop their existing springs on their land. This project would serve two essential purposes: Protect the water resource coming from these springs, especially from livestock disturbance; and to provide additional water for livestock use. The primary practices utilized for this project would include: (574) Spring Development, (533) Pumping Plant, (516) Livestock Pipeline, (614) Watering Facility, (528) Prescribed Grazing, and (382) Fence.
- **Goals:** 30 spring developments, and at least 20,000 acres of Prescribed Grazing.
- **Monitoring and Evaluation:** Projects will be monitored through annual contract status reviews. Before and after documentation of the spring developments will be performed.
- **Partners & Alternative Funding:** Private Landowners, Big Horn Conservation District.

#### Little Big Horn River Water Quality

- **Purpose:** Assist Landowners in the Little Big Horn Watershed to relocate Animal Feeding Operations (AFO) and Concentrated Animal Feeding Operations (CAFO) away from the Little Big Horn River in order to improve water quality along the Little Big Horn River.
- **Primary Resource Concern Addressed:** Water Quality Degradation – Excess Nutrients in Surface Waters
- **Location:** Big Horn County within the Little Big Horn Watershed.
- **Summary:** Big Horn County has at least 200 small livestock operations with cattle, horses, and other animals. Many of these are located near waterways such as the Little Big Horn River, and deliver nutrients, organic material, and potential pathogens downstream. These livestock operations are usually not monitored by MT DEQ and don't require CAFO permits. A high percentage of such operations could be considered low management. Grazing occurs all year long on many of these. The headquarters and barn areas are typically muddy, ponded and have surface run-off with substandard housing and wintering areas. In some cases, livestock are not excluded from waterways or wetland access. Several of the operators are beginning farmers or limited resource operators..
- **Goals:** At least 10 AFO/CAFO's relocated from waterways.
- **Monitoring and Evaluation:** Contract Status reviews will be performed twice-yearly during the contract duration, and extensive documentation will be taken before and after project implementation, with the results being shared at a local educational workshop regarding water quality.
- **Partners & Alternative Funding:** Private Landowners, Big Horn Conservation District, Crow Tribe of Indians, Crow EPA, and MSU Extension.

#### Pryor Creek Water Quality

- **Purpose:** Assist Landowners in the Pryor Creek Watershed to relocate Animal Feeding Operations (AFO) and Concentrated Animal Feeding Operations (CAFO) away from the Pryor River and its tributaries in order to improve water quality along the Pryor River.
- **Primary Resource Concern Addressed:** Water Quality Degradation – Excess Nutrients in Surface Waters
- **Location:** Big Horn and Yellowstone Counties within the Pryor Watershed.
- **Summary:** Big Horn and Yellowstone Counties have numerous small livestock operations with cattle, horses, and other animals. Many of these are located near waterways and deliver nutrients, organic material, and potential pathogens downstream. These livestock operations are usually not monitored by MT DEQ and don't require CAFO permits. A high percentage of such operations could be considered low management. Grazing occurs all year long on many of these. The headquarters and barn areas are typically muddy, ponded and have surface run-off with substandard housing and wintering areas. In some cases, livestock are not excluded from waterways or wetland access. Several of the operators are beginning farmers or limited resource operators.
- **Goals:** At least 10 AFO/CAFO's relocated from waterways. This project would cover approximately five years.
- **Monitoring and Evaluation:** Contract Status reviews will be performed twice-yearly during the contract duration, and extensive documentation will be taken before and after project

implementation, with the results being shared at a local educational workshop regarding water quality.

- **Partners & Alternative Funding:** Private Landowners, Big Horn Conservation District, Yellowstone Conservation District, Crow Tribe of Indians, Crow EPA, and MSU Extension.

#### Sulphur Cinquefoil Control on the Crow and Northern Cheyenne Indian Reservations (FUNDED)

- **Purpose:** To control existing Sulphur Cinquefoil infestations on the Crow and Northern Cheyenne Indian Reservations
- **Primary Resource Concern Addressed:** Degraded Plant Condition - Excessive plant pest pressure
- **Location:** Big Horn and Rosebud Counties, Crow and Northern Cheyenne Indian Reservations.
- **Summary:** Sulphur Cinquefoil is a Montana-listed noxious weed that has invaded pasture and rangeland, significantly degrading rangeland health in these areas. This project seeks to provide assistance with inventorying infestations and providing cost-share to control this weed, while also offering other practices that can help facilitate the implementation of a grazing plan in order to improve rangeland health and resilience to weed infestations.
- **Goals:** 20 EQIP Contracts with 1500 acres of (315) Herbaceous Weed Control, and 10,000 acres of Prescribed Grazing.
- **Monitoring and Evaluation:** Contract Status reviews will be performed twice-yearly during the contract duration, and extensive documentation will be taken before and after project implementation. Program outreach will be provided at workshops throughout both reservations, as well as educational workshops regarding weed identification and control and prescribed grazing being offered throughout the counties as well.
- **Partners & Alternative Funding:** Private Landowners, Big Horn Conservation District, MSU Extension, Big Horn County Weed Control District, Crow Tribe of Indians, Northern Cheyenne Tribe of Indians, Bureau of Indian Affairs.
- Sulfur cinquefoil has been found in the following areas of BHC: Wolf Mountains, Rotten Grass Creek, Western 2/3 of Northern Cheyenne Reservation. Especially seen in higher precipitation areas (at least 16-18" annual precip) and found in open draws.
- Provide education regarding identification, control methods, and management. EQIP funding for control of these weeds.
  - Practices: 342, 512, 550, 528, 315.
  - Priority given: High to those will to use a combination of herbaceous weed control (315), re-vegetation, and grazing management. Med to those who will use 315, and either re-vegetation or grazing management. Low to those who only wish to use 315.
  - Follow-up on past weed control projects has been an issue. Need to schedule follow-up annual on these control sites for at least 5 years following control.

#### Salinity Control on Dryland Crop in Big Horn County (FUNDED, Via Montana Salinity Control Association's RCPP Project)

- **Purpose:** Address saline seep issues on dryland crop in Big Horn County.
- **Primary Resource Concern Addressed:** Soil Quality Degradation - Concentration of salts or other chemicals

- **Location:** Dryland Crop in Big Horn County.
- **Summary:** Work with farmers to address issues with growing saline seeps on dryland crop areas in Big Horn County. This project would consult with the Montana Salinity Control Association to install shallow groundwater monitoring wells, determine the location and extent of seep and recharge areas, and prescribe a saline-tolerant forb/grass mix for the recharge areas.
- **Goals:** 10 EQIP contracts addressing Saline and Sodic-Soil Management on approximately 1000 acres.
- **Monitoring and Evaluation:** Annual status reviews will be performed for the life of the EQIP contracts, and results of these projects will be presented at educational salinity management workshops.
- **Partners & Alternative Funding:** Private Landowners, Big Horn Conservation District, MSU Extension, and Montana Salinity Control Association.
- Working with the Montana Salinity Control Association (MSCA) to help address saline seeps on dryland crop in Big Horn County.

#### Expiring CRP Conversion to Grassland (FUNDED)

- **Location:** Expiring CRP in Big Horn and Yellowstone Counties
- **Summary:** Prevent expiring or recently expired CRP acres from being converted back to cropland, and to ensure adequate herbaceous cover remains on these acres.
- **Goals:** 8 EQIP Contracts to install practices that can ensure these acres remain in perennial herbaceous cover (Fence, Watering Facility, Livestock Pipeline, Pumping Plant, Water Well, etc.), and also encourage Prescribed Grazing to be implemented on these acres.
- **Monitoring and Evaluation:** Annual status reviews will be performed for the life of the EQIP contracts, and results of these projects will be presented at educational grazing management workshops.
- **Partners & Alternative Funding:** Private Landowners, Big Horn Conservation District, and MSU Extension.

#### Irrigation Improvement Turbidity Reduction

- **Location:** Irrigated cropland along the first thirteen miles of the Big Horn River in Big Horn County, MT.
- **Summary:** Address turbidity issues in surface water in the Big Horn River by converting flood-irrigated acres to Center Pivot or Subsurface Drip Irrigation, requiring Irrigation Water Management and incentives for soil health practices such as, Residue and Tillage Management and Cover Crop.
- **Goals:** 6 EQIP Contracts, addressing approximately 500 acres.
- **Monitoring and Evaluation:** Annual status reviews will be performed for the life of the EQIP contracts, and results of these projects will be presented at educational grazing management workshops.
- **Partners & Alternative Funding:** Private Landowners, Big Horn River Conservation Alliance (BHRCA), Big Horn Conservation District, and MSU Extension. BHRCA currently has a research initiative underway, and part of this initiative highlighted the need for addressing turbidity in the



Big Horn River. Results of this TIP proposal can be shared through the BHRCA's annual report and meeting.

#### Big Horn River Water Quality

- **Location:** Lands directly adjacent to the Big Horn River in Big Horn County, MT.
- **Summary:** Addressing uncontrolled livestock access to the Big Horn River and improving surface water quality by fencing out the Big Horn River and providing alternative water sources for livestock.
- **Goals:** 15 EQIP Contracts to install practices that can prevent livestock access to the Big Horn River and provide off-site water sources (Fence, Watering Facility, Livestock Pipeline, Pumping Plant, Water Well, etc.), and also encourage Prescribed Grazing to be implemented on these acres.
- **Monitoring and Evaluation:** Annual status reviews will be performed for the life of the EQIP contracts, and results of these projects will be presented at educational grazing management workshops.
- **Partners & Alternative Funding:** Private Landowners, Big Horn River Conservation Alliance (BHRCA), Big Horn Conservation District, and MSU Extension. BHRCA currently has a research initiative underway, and part of this initiative highlighted the need for addressing water quality issues in the Big Horn River. Results of this TIP proposal can be shared through the BHRCA's annual report and meeting.

#### Kirby-Area Forestry Improvement

- **Location:** Forested acres in the Kirby and Rosebud Battlefield State Park areas in Big Horn County, MT.
- **Summary:** Implementing forest improvement plans on ranches in the project area, which can help improve the grazing resource and mitigate fire danger on timbered acres.
- **Goals:** 10 EQIP Contracts to address Timber Management (Forest Stand Improvement, Brush Management, Woody Residue Treatment, etc.), and to also encourage implementation of Prescribed Grazing on these acres.
- **Monitoring and Evaluation:** Annual status reviews will be performed for the life of the EQIP contracts, and results of these projects will be presented at educational workshops.
- **Partners & Alternative Funding:** Private Landowners, Montana Department of Natural Resources and Conservation (MT DNRC), Big Horn Conservation District, and MSU Extension. MT DNRC will work with USDA-NRCS to provide assistance in the development of Forest Management Plans.

#### Education & Outreach Plans:

##### **Workshops:**

- Ladies Ag Night in Hardin- This workshop has been held in conjunction with NRCS, Farm Service Agency, and MSU Extension; 2020 was the tenth year this annual workshop had been held in Hardin. Two to three varying ag-related topics are covered at each workshop, a free meal is provided, and there is no cost to attend. This workshop has been an excellent opportunity for area women to network and learn about different ag and natural resource topics. 2021 and COVID-19 provided a bit of a challenge for hosting LAN, and so the committee decided to send

educational packets out to our mailing list. Hopefully things will be looking a little brighter for 2022.

- USDA Outreach Workshops- Held in conjunction with other USDA agencies, and throughout different locations in Big Horn County, this workshop serves to give the public general information about the availability of USDA programs and other assistance that the agencies can provide. This workshop will continue to be held twice yearly.
- Horse Owners Workshop- The purpose of this workshop is to provide education to horse owners and/or small acreage landowners on equine husbandry and management of their grazing lands. This workshop will be held every other year and has usually been held in either Hardin or Crow Agency.
- Invasive Grass Species Workshop – The purpose of this workshop is to educate participants on the identification, control, and prevention methods for some of the common invasive and noxious annual grass species.
- Gardening Workshop- Geared towards gardeners, both backyard and large-scale, this workshop serves to educate people about different methods of gardening, soil health, and pest management.
- Water Quality along the Big Horn River Workshop Series
  - Topics to address this Resource Concern (Several of these could possibly be funded through the BHCD's 223 Grant):
    - Crop Production Basics
    - Basics of Rangeland Management
    - Horse Owners Workshop
    - AFO/CAFO's
    - Invasive Grass ID Workshop
- Targeted Workshops Regarding Ventenata Control:
  - Invasive Grass Identification Workshops- Planned for four locations (Hardin, Pryor, Decker, and Crow Agency) in Big Horn County. The purpose of this workshop is to educate participants on the identification, control, and prevention methods for some of the common invasive and noxious annual grass species.
  - Rangeland Management Field Day – Field tour to two ranches west/southwest of Lodge Grass, MT, where the producers both utilize intensive grazing rotations on their ranches in order to increase rangeland health, and to fight invasive and noxious plant species on their ag operations.
  - Rangeland Management Basics Workshop – Planned for one location, probably in Hardin. This workshop will cover the Whys, How's, and various methods for rangeland management. This would be a similar workshop to one we held in Crow Agency, MT in September 2018.
  - Long-Term Rangeland Management Workshop – Held over two days, this intensive workshop would work with ranchers on developing a grazing rotation on their ag operation and educate attendees about why range and pastureland management is so important for their ranches. We're hoping to follow a similar format that the Baker NRCS FO has implemented over past years in their county.

**Sources for Outreach in Big Horn County:**

- Big Horn County News
- The Original Briefs
- The Mighty 790 AM Radio Station

- Flyers
- Postal Mailings
- Emails
- Social Media
- Conservation District Newsletters
- USDA GovDelivery Emails and Mailing Lists

## **Section VII. References and Maps**

### **References:**

- Crow Tribe and Big Horn County Resource Assessment, December 1997.
- Soil Survey of Big Horn County Area, Montana, December 1977.
- Rehabilitation and Improvement of Crow Irrigation Project Montana, Draft Programmatic Environmental Assessment, Oct. 2014.
- Water Resources Survey, Big Horn County, State Water Conservation Board, May 1947
- Montana Natural Heritage Program <http://mtnhp.org/SpeciesOfConcern/>
- US Fish & Wildlife Service <https://www.fws.gov/montanafieldoffice/>
- MT DEQ TMDL Plan Map <http://deq.mt.gov/Water/SurfaceWater/TMDL/tpamap>
- MT DEQ Clean Water Act Information Center <http://svc.mt.gov/deq/dst/#/app/cwaic>
- Yellowstone River Cumulative Effects Analysis, Yellowstone River Conservation District Council, December 2015

Maps:

- Big Horn River Basin Map

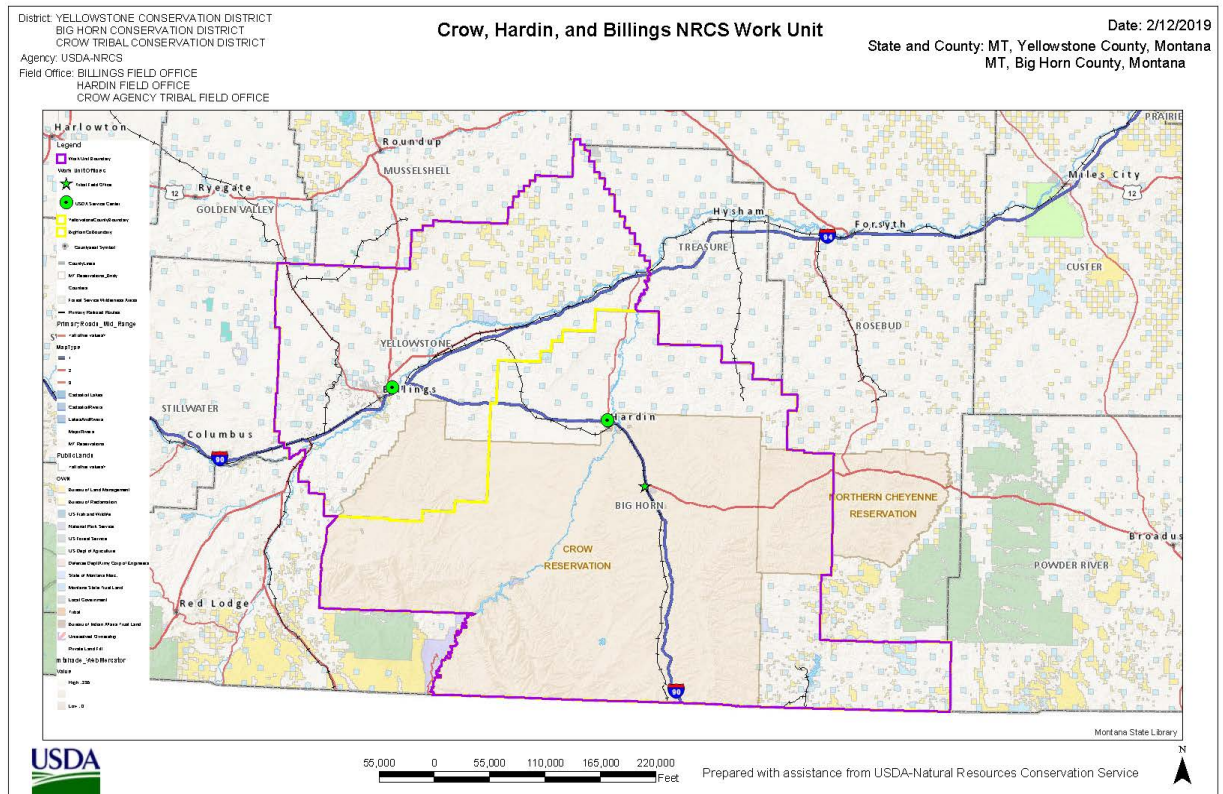


**Big Horn River Basin Map** Source DEMIS Mapserver

**Figure 6.0**



- **Work Unit Map for the Crow Agency, Hardin, and Billings NRCS Work Unit**



**Figure 6.1**

- Watershed Map for Big Horn County (Source: USDA-NRCS Hydrology Information)

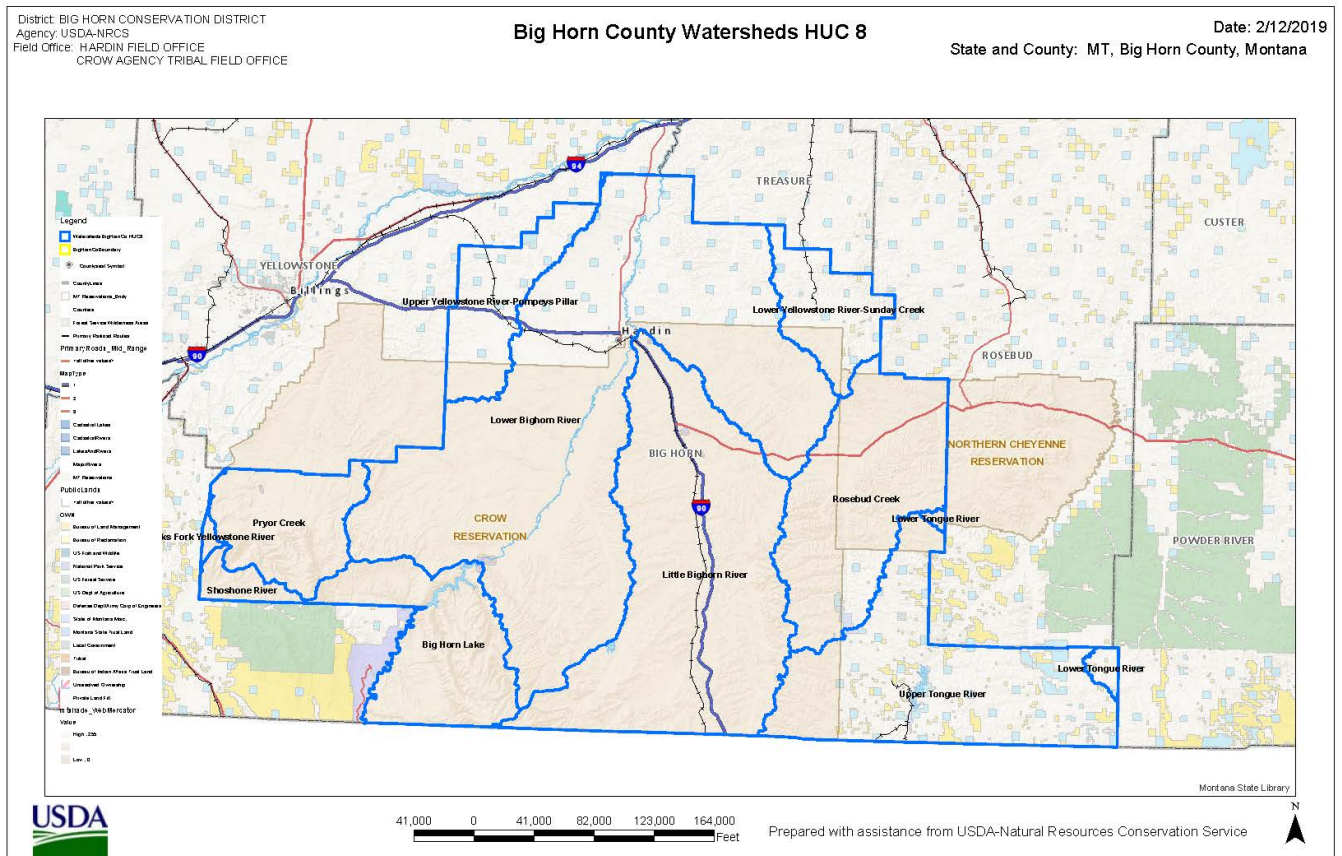
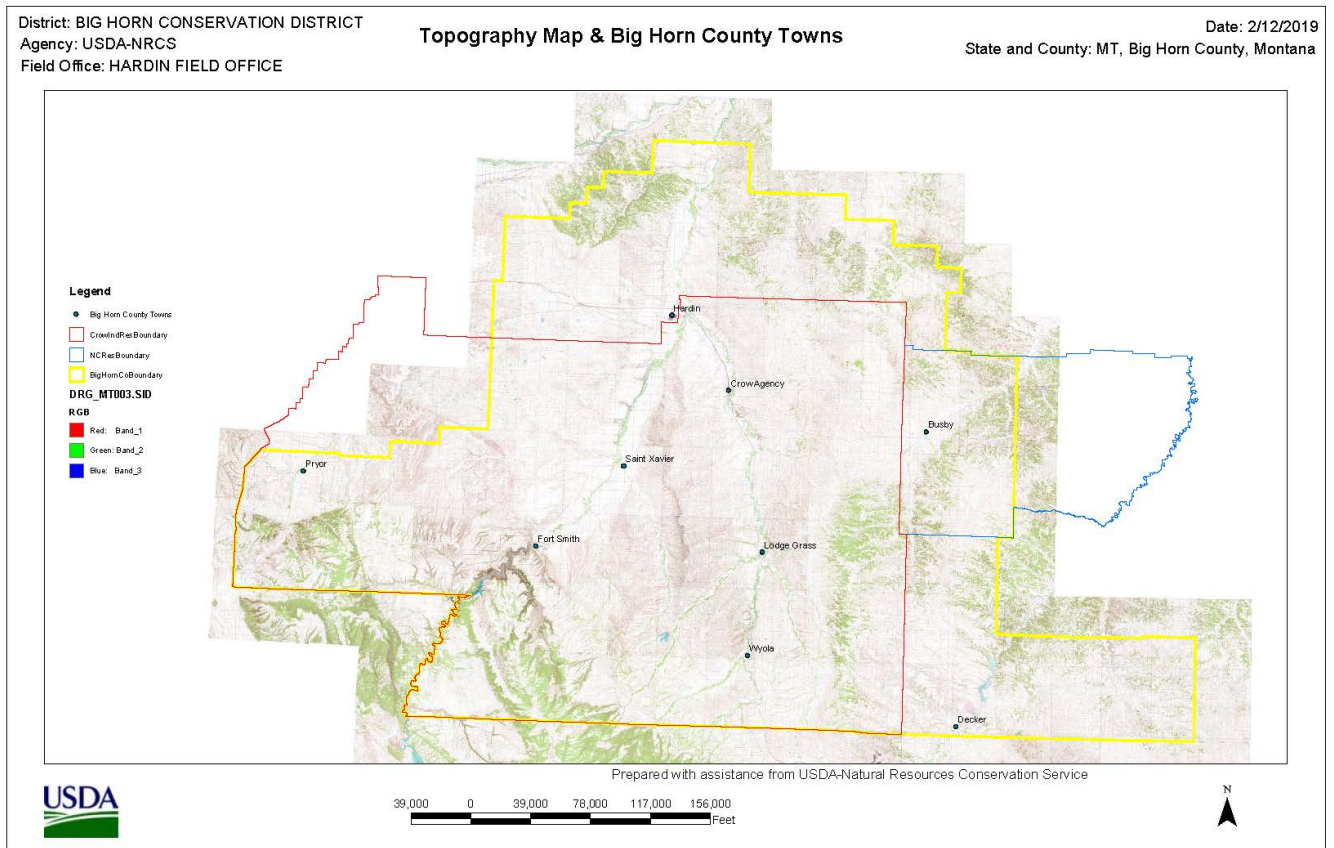


Figure 6.2

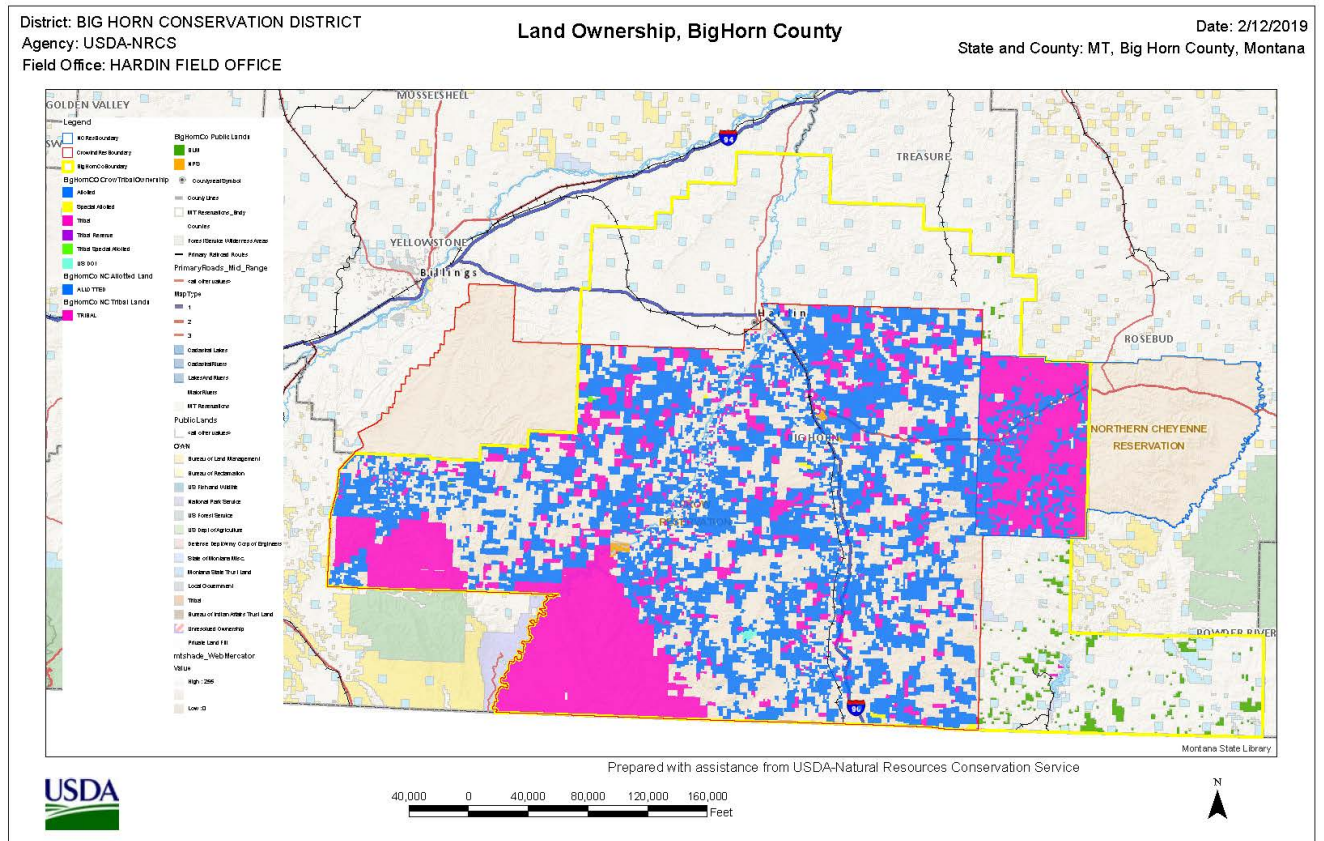
- **Topography Map with Big Horn County Towns**



**Figure 6.3**



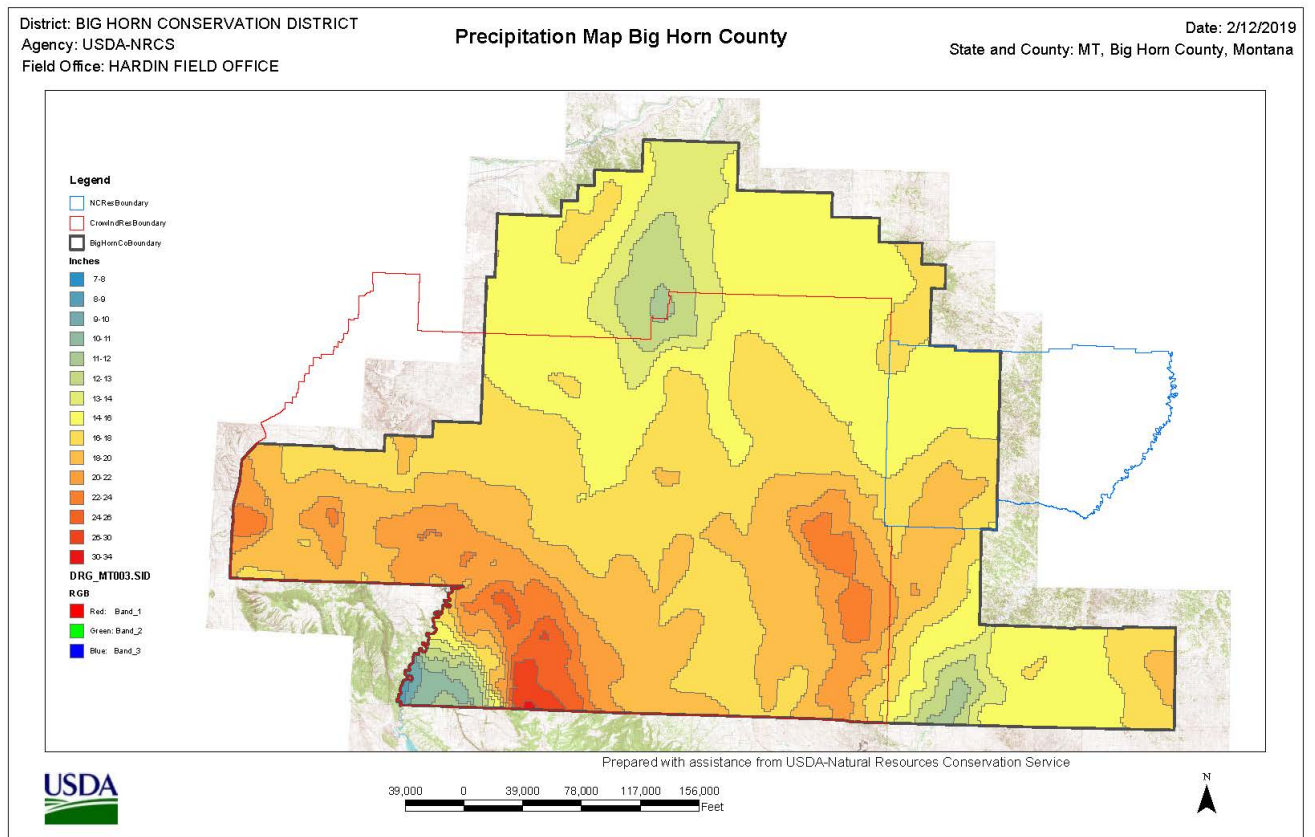
- **Ownership Map for Big Horn County (Source: USDA-NRCS Montana Cadastral GIS Information)**



**Figure 6.4**

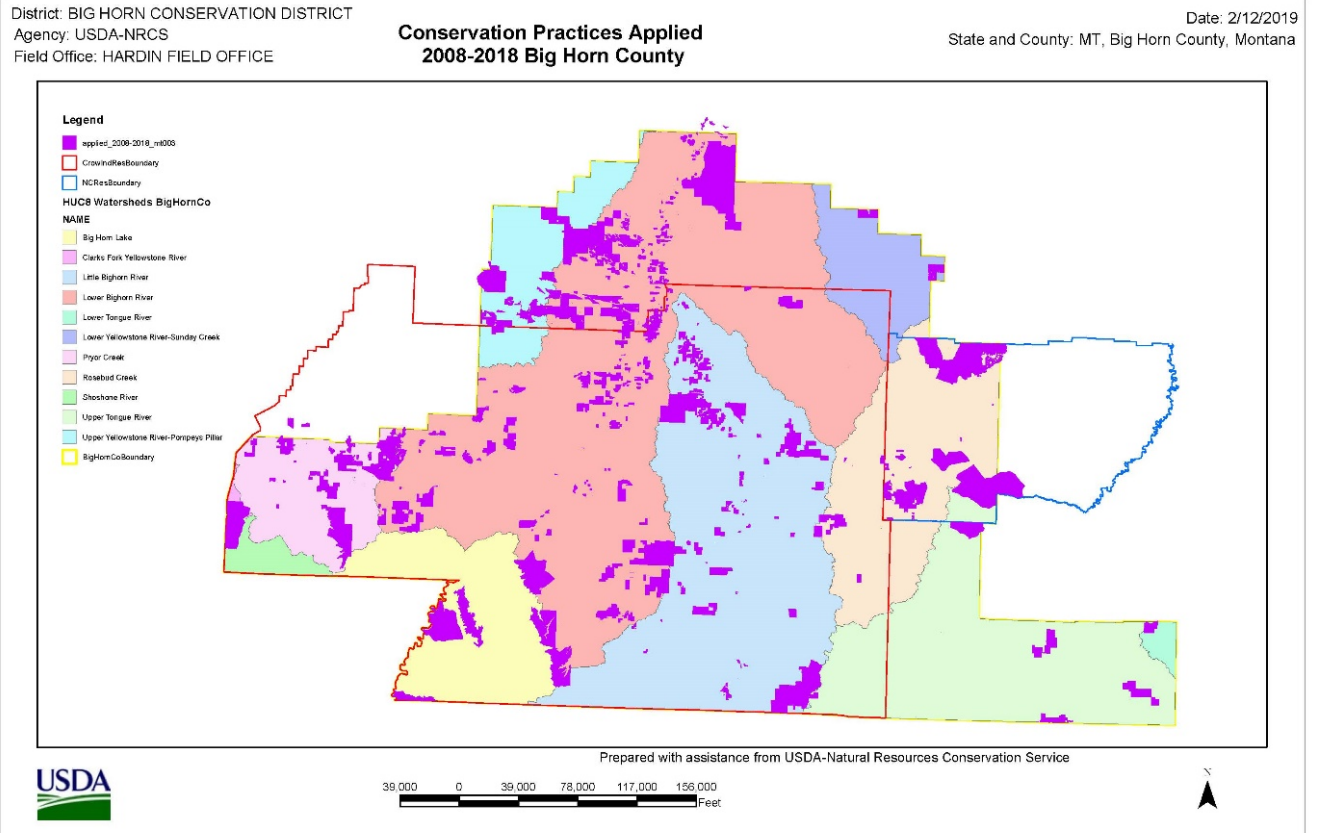


- **Precipitation Map for Big Horn County (Source: USDA-NRCS GIS Imagery)**



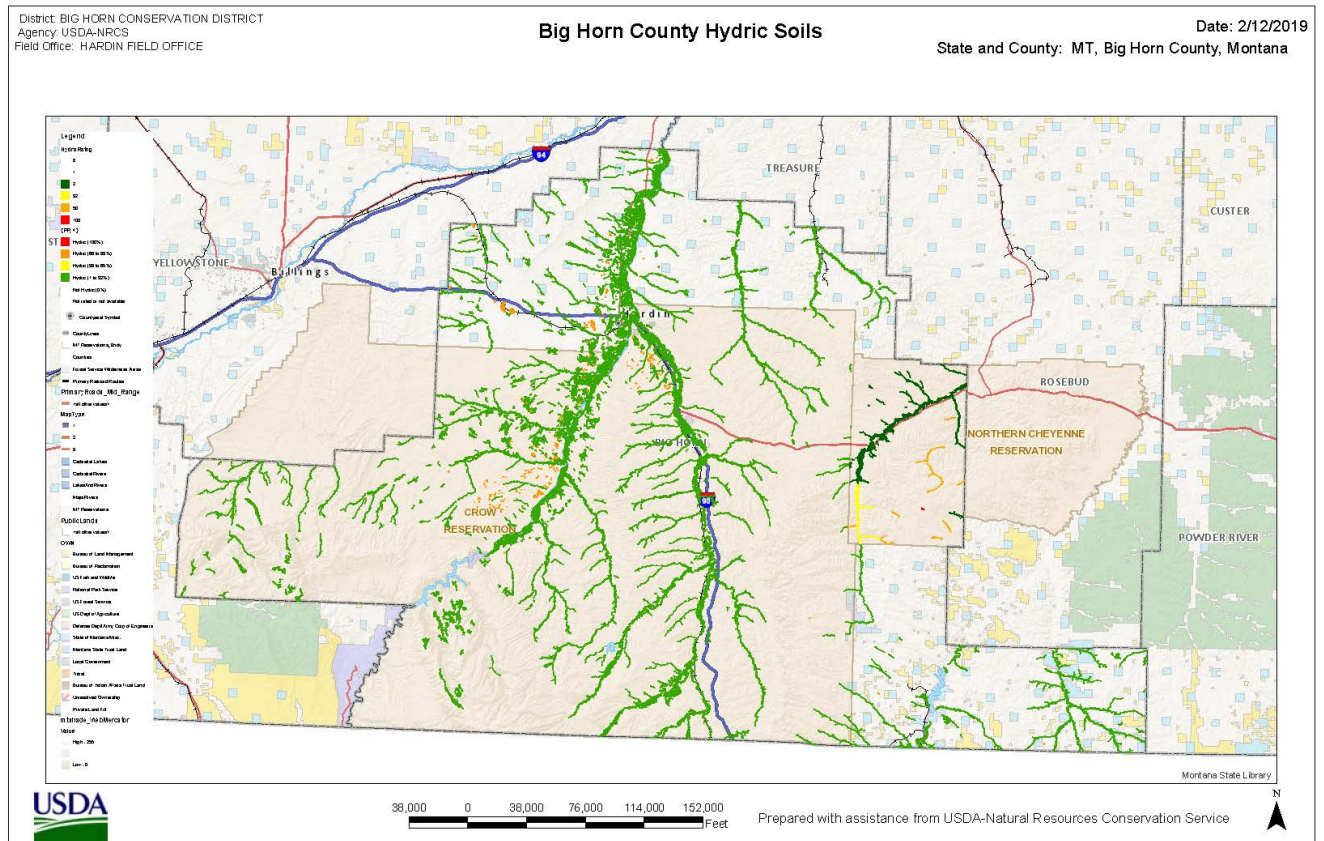
**Figure 6.5**

- IDEA Map for Conservation Practices Completed in Big Horn County from 2008-2018



**Figure 6.6**

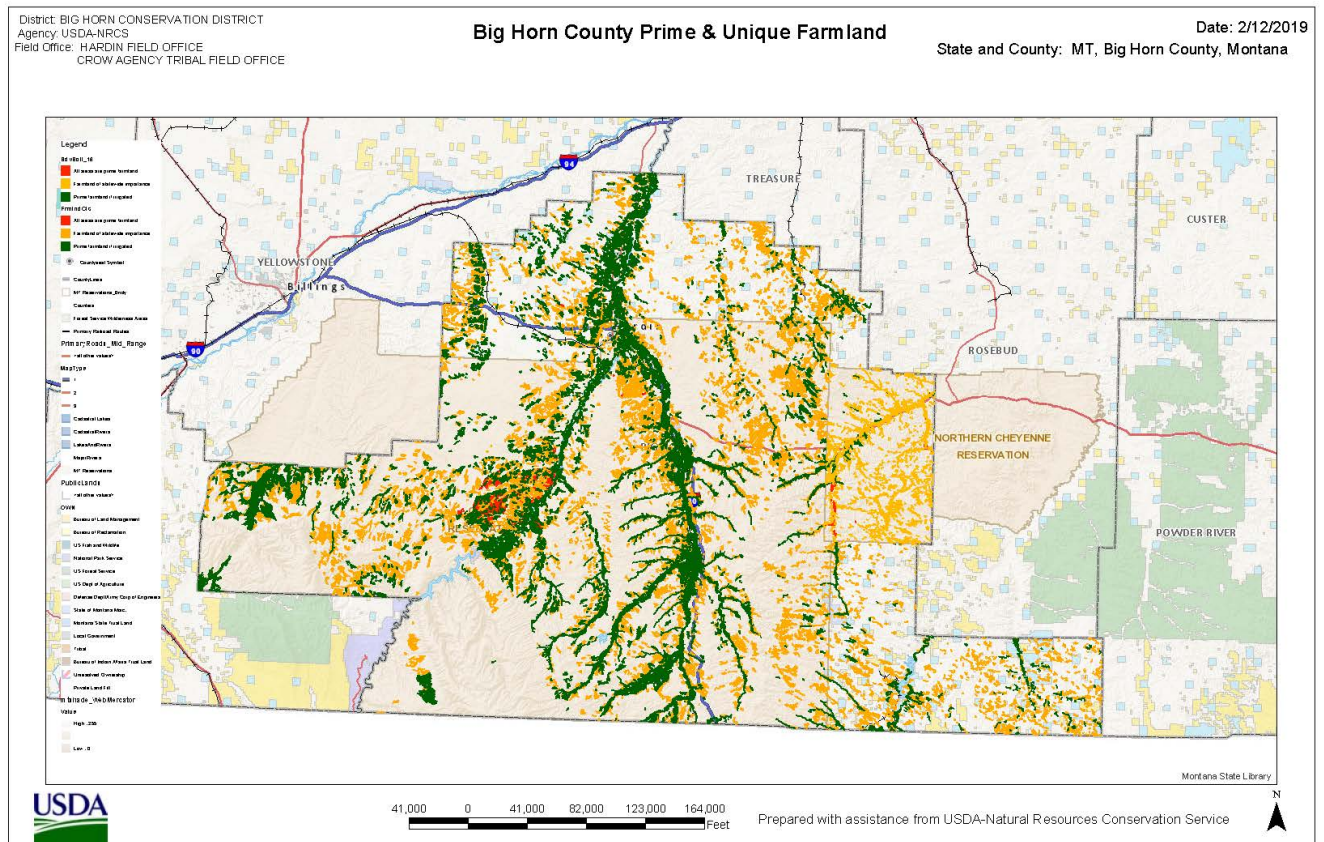
- Hydric Soils for Big Horn County (Source: Big Horn County Soil Survey)



**Figure 6.7**



- **Prime and Unique Farmland Soils Map for Big Horn County (Source, Big Horn County Soil Survey)**



**Figure 6.8**